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EPIDEMIC DROPSY AND MUSTARD OIL

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In one of our previous publications (Palit and Basu, 1939), we have made a systematic investigation on the ætiology of 'beri beri' or epidemic dropsy. In the same publication, we have mentioned that the analysis of several samples of 'Bazar Mustard Oil' revealed the presence of hydrocyanic acid and that we were carrying on some more feeding experiments with laboratory animals using pure as well as bazar samples of mustard oil. We have also mentioned that we were studying the chemical changes in the properties of the substance or substances as obtained by the decomposition of the several samples of mustard oil when heated to high temperatures, *i.e.*, to their boiling points.

We shall first give an account of the results of the analysis of the various samples of mustard oil, before heating as well as after heating as obtained from different sources and then a full account of the feeding experiments carried on in this laboratory with animals and the field experiments, using mustard oils, pure as well as adulterated, along with their diet.

The ætiology of the disease 'Beri-Beri' or epidemic dropsy is still shrouded in mystery. The investigations by various workers have mainly centered round three theories, which have superseded other minor theories. The ætiological agents according to these three theories are: 1. Rice Theory. 2. Mustard Oil Theory. 3. Infection Theory.

The studies of Lal and his collaborators (1937) and that of Palit and Basu (1938) throw doubt on the validity of the 'rice theory', point out certain difficulties in accepting the contagion theory and provide suggestive evidence for holding mustard oil as the probable ætiological agent. Thus they tried to narrow down the issues but they could not offer positive evidence as to the nature of the ætiological agent. Hence, each of these hypotheses remains to be tested under well controlled conditions.

The findings in certain consignments of mustard oil of a fairly large amount of hydrocyanic acid by Dutt (1937) and the suggestions put forward regarding the association of this constituent with epidemic dropsy deserve attention. The data presented by Dutt need close examination in the light of modern knowledge about cyanide poisoning. According to Dutt (*loc. cit*), the symptoms commonly associated with epidemic dropsy are similar to those produced by 'cardiac poisons like thevatin, digitoxin, strophanthin, hydrocyanic acid and cyanides'. But Mukherji (1938) has pointed out that 'physiologists, pharmacologists and clinicians will find it hard to agree with such a statement. Though the ætiology of epidemic dropsy has not yet been finally worked out, sufficient work (Chopra, Choudhury and De, 1937; Chopra and Choudhury 1937; Chopra, Choudhury and Sen Gupta, 1937; De and Chatterji, 1935) has been reported on the clinical,

radiological and pathological aspects of the disease and the evidence available is conclusive enough to warrant the statement that the circulatory manifestations in epidemic dropsy are typical and characteristic and do not agree with the symptoms produced by drugs of the digitalis group. Hydrocyanic acid has been classed in the same category as the digitalis group of drugs. It is really a poison to tissue respiration and interferes with cellular oxidations, and the circulatory symptoms associated with cyanide poisoning are really secondary to asphyxia of the tissues. Digitalis-like drugs are all characterised by an increase of tone, excitability, contractility and refractory phase of the cardiac muscle with showing of conduction through the auriculo-ventricular bundle. Such manifestations are seldom, if at all, met with cyanide poisoning".

The maximum concentration of hydrocyanic acid as recorded by Dutt in a sample of mustard oil from Benares is 0·7 per cent, which is equivalent to 7 Mgs. of HCN per c.c. of mustard oil. Now the fatal dose of HCN varies from 34-50 Mgs. (De and Chatterji, 1935; Solmon, 1936; Sydney Smith, 1933) for an adult weighing about 150 lbs. So about 6 or 7 c.c. of such an adulterated oil which is not infrequently consumed by a large section of the population is enough to produce a fatal effect. Even smaller amounts will produce toxic manifestations but no evidence is available which may indicate that epidemic dropsy cases develop symptoms resembling acute cyanide poisoning by taking adulterated mustard oil. Apparently, therefore, hydrocyanic acid is not introduced in the system in such a high concentration. Hence, we found it worth-while to re-investigate the problem and to analyse various samples of mustard oil as obtained from several sources.

Experiments

The method of analysis of mustard oil:

Exactly 50 c. c. of mustard oil are taken by pipette into a separating funnel of about 250 c.c. capacity. 50 c. c. of 60% alcohol are added to the oil in the separating funnel and the contents are vigorously shaken for 15 minutes. The emulsified product is then allowed to stand for half an hour whereby a complete separation of two layers will be effected, the oil settling at the bottom and the alcoholic layer on the top. The mustard oil layer is then removed from the bottom into another separating funnel of the same capacity and is again shaken with another 50 c. c. of dilute alcohol as before and the alcoholic layer separated. The combined alcoholic layers are then filtered once or twice until a clear filtrate is obtained. Call this filtrate A.

Method I—To the whole of this clear filtrate A, 2 c. c. of 20% nitric acid and then an excess of silver nitrate (2% solution) are added and silver cyanide is precipitated. The sulphides and mercaptans whose occurrence is definitely known in mustard oil in small amounts, are also precipitated with silver nitrate along with silver cyanide. These precipitates are now treated with ammonia in which only silver cyanide is soluble and the insoluble silver sulphide is removed and washed well. The silver cyanide is then reprecipitated by acidifying with nitric acid. This precipitate is filtered, washed, dried out and weighed and the cyanides are calculated as hydrocyanic acid. The results of estimation of hydrocyanic acid in several samples of the mustard oil obtained from different sources are given in column I of the Table.

Defects of this method of estimation—This method, however, is not free from defects. It cannot be assumed that only the cyanides and sulphides are precipitated with silver nitrate. Traces of cyanates have also been detected and silver cyanate is as soluble in ammonia as silver cyanide and these two are inseparable. Moreover, the aromatic and aliphatic nitrites and cyanohydrins cannot give a precipitate of silver cyanide with silver nitrate, because the cyanogen group is not present in the free or dissociable state. Hence, the above method (I) has to be modified and the modification adopted for the estimation of the total cyanides is as follows:—

Method II(*a*)—An aliquot part of the alcoholic extract A is taken, made alkaline with caustic soda and distilled cautiously on water-bath to remove the alcohol. A little more alkali is then added and the mixture is heated with a reflux condenser for ½ hour. Proper care should be taken during the alcoholic extraction process to see that no oil comes out with the extract, because the oil will cause saponification at this stage of the process and considerably vitiate the process. Hence the alcoholic filtrate A must be clear and free from oil. The inorganic cyanides and cyanohydrins which are present in the oil in large amounts are converted into sodium cyanide by this process of treatment with caustic soda thus:

$$>C<\begin{matrix}OH\\CN\end{matrix}+Na\,OH=>C=O+NaCN+H_2O.$$

(Cyanohydrin)

Now this mixture is acidified and distilled carefully. The hydrocyanic acid is evolved and is then absorbed in a flask containing a standard solution of caustic soda of about N/1000 kept in ice. The hydrocyanic acid combines with the alkali forming sodium cyanide. This mixture of sodium cyanide and caustic soda is then made upto a known volume. A standard solution of pure sodium cyanide (Merck's) of about N/1000 is prepared and is standardised by silver nitrate and then made slightly alkaline with ammonia. The Prussian blue colour is developed in equal volumes of the known and unknown solutions by the usual process and the blue colour so developed is then matched in a colorimeter and the amount of cyanides is then calculated as hydrocyanic acid. This determines only the inorganic cyanides and the cyanogen content from the cyanohydrins.

(*b*) The nitriles present in mustard oil in very minute quantities do not give or produce sodium cyanide on hydrolysis by alkali [Method II(*a*)] but form the corresponding sodium salts of carboxylic acids. These nitriles do not come in the quantitative colorimetric estimation just described above [Method II(*a*)]. Hence for the estimation of these nitriles, the following method is adopted which is based on the following reaction:—

$R—C{\equiv}N+2H_2O$ alkali hydrolysis R. $COOH+NH_3$ where R is the aliphatic or the aromatic group. We thus find that carboxylic acids as well as ammonia are formed.

Hence for the estimation of these, another similar portion of the alcoholic extract A is taken, made strongly alkaline, refluxed and aspirated for 5-6 hours. This process will cause the decomposition of the nitriles evolving ammonia which is absorbed in standard solution of dilute sulphuric acid catch and the amount of nitrogen estimated colorimetrically by Nessler's reagent, comparing against a standard solution of ammonium sulphate. From this the amount of nitrogen due to nitriles is calculated as H C N. Hence the total amount cyanides as obtained by the above two processes (*a*) and (*b*) of Method II will be the sum total of the result of these two processes.

Estimation of allylisothiocyanate:—The method of estimating allylisothiocyanate in mustard oil is a modification of that adopted by the Association of Official Agricultural Chemists, U.S.A. It may be briefly described as follows:—

10 grams of oil were weighed in a flask and 20 c. c. of 95% alcohol were added. The mixture was distilled in steam for ½ hour, collecting about 100 c.c. of the distillate into a 250 c. c. measuring flask containing 10 c. c. of 30% ammonia. Care was taken that the end of the condenser remained dipped below the surface of the solution. 20 c. c. of N/10 silver nitrate solution were added to the distillate and allowed to stand over night. The contents were then heated to boiling over a water-bath for 15 minutes, cooled, made u to 250 c. c. and filtered. 100 c c. of this filtrate were then acidified with 5 c. c. of concentrated nitric acid and titrated with N/10 ammonium sulphocyanide solution, using 3 c. c. of 10% Ferric Alum as indicator. Allylisothiocyanate is then estimated from the volume of silver nitrate used up. Thus 1 c.c. of N/10 $AgNO_3$=4·956 Mg. of allylisothiocyanate.

Lal, Ahmad and Roy (1938) have conclusively shown by a series of experiments that this method gives a fairly accurate estimation of the amount of allylisothiocyanate present in the oil.

Again 100 c.c. of each of the various samples of mustard oil were taken, heated to boiling for 5 minutes in open porcelain dish, then cooled in air and the estimations of cyanides and allylisothiocyanate were made by the methods just described. The results of estimation of cyanides and allylisothiocyanate and the iodine value are given in the following table:—

No. of Ex.	Name of the sources from where the oil was obtained.	Condition of the oil under which the Expt. was done.	Amount of cyanides calculated as HCN in gram in 100 grams of oil as estimated by Method I.	Method II (a & b).	Amount of allyl-isothiocynate in milligram per 100 grams of oil.	Iodine value.
1.	Inayat Khan Allahabad.	(*a*) Cold normal oil.	0·0208	0·0041	300·18	110·2
		(*b*) Boiled oil.	Nil	Nil	Nil	75·2
2.	Madan Stores Allahabad.	(*a*) Cold normal oil.	0·024	0·0048	341·9	105·7
		(*b*) Boiled oil.	0·0054	in traces only	9·74	74·2
3.	Bholanath Oil Mill, Daryabad, Allahabad.	(*a*) Cold normal oil Sample 1.	0·026	0·0052	267·6	100
		(*b*) Cold normal oil Sample 2.	0·0298	0·006	338·49	..
		(*c*) Boiled oil Sample 1.	in traces only	Nil	14·98	79·4
4.	Ghee Bhandar, Nakhas Kona Allahabad.	(*a*) Cold normal oil.	0·022	0·0044	301·32	106·0
		(*b*) Boiled oil.	Nil	Nil	Only in traces	65·8
5.	Chhotey Lal, Daragunj.	(*a*) Cold normal oil.	0·0302	0·006	420·27	104·0
		(*b*) Boiled oil.	Nil	Nil	Nil	83·7
6.	Thakur Ram, Allahabad.	(*a*) Cold normal oil	0·0298	0·0059	396·5	110·5
		(*b*) Boiled oil.	Nil	Nil	Only in traces	79·5
7.	Municipal oil from the Municipality, Allahabad.	(*a*) Cold normal oil. machine pressed.	0·012	0·0024	212·91	..
		(*b*) Cold normal oil hand pressed.	0·0218	0·0043	272·5	..
8.	Bhagawandin. Allahabad.	Cold normal oil.	0·027	0·0054	270·28	..
9.	Shankar Lal.	Cold normal oil.	0·0264	0·0053	264·92	..
10.	Pure Argemone oil.	Cold normal oil.	Nil	Nil	93·0	..

From the above table, it is seen that the amount of cyanides calculated as HCN is very small as estimated by Method II (*a*) and (*b*) combined, which is the most correct method and even this small amount of cyanides disappears or volatilises when the oil is heated to boiling. Similar is the case with allylisothiocyanate present in the oil, which volatilises also when the oil is boiled. The iodine value also drops down considerably when the oil is heated to boiling. It is interesting to note that in almost all the samples of the oil analysed, the amount of cyanides in the oil as estimated by Method II (a+b) is about 1/5 of the results obtained by Method I.

Discussion

In our opinion the cyanide theory of Dr. S. B. Dutt does not seem to hold any ground on account of the following reasons:—

1. The nitriles and cyanohydrins hydrolyse with the acid of the stomach and form non-toxic non-poisonous carboxylic acids thus:—

$$RCN+2H_2O=R.\ COOH+NH_3 \quad \text{.....(i)}$$

and $>C\begin{matrix}HO\\CN\end{matrix} <+2H_2O= >C<\begin{matrix}OH\\COOH\end{matrix}+NH_3$ .....(ii)

2. The amount of hydrocyanic acid introduced into the system is so very small that it is almost immediately converted into a comparatively non-toxic compound of the type HSCN [Bodansky, (1929); Smith and Malcolm, (1930)] or of the type HCNO [Vœgtlin, Johnson and Dyer, (1926)] through the mediation of sulphur compounds present in the body such as cystin, cystein, glutathione etc. thus:—

$$\begin{matrix}R-S\\ \quad |\\R-S\end{matrix} +HCN=RSH+RSCN \quad \text{.....(i)}$$

and

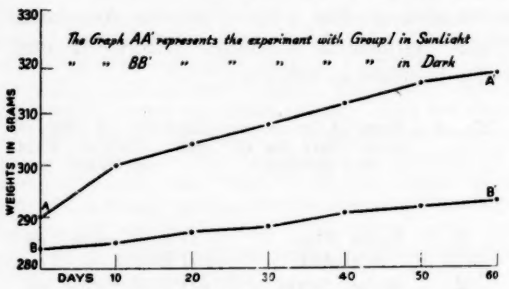
$$\begin{matrix}R-S\\ \quad |\\R-S\end{matrix} +KCN+H_2O=2RSH+KCNO \quad \text{.....(ii)}$$

The experimental results show that in almost every case the amount of cyanides calculated as HCN in several samples of mustard oil is very small and that when the oil is heated to boiling, the same becomes almost nil. Hence, slow cyanide poisoning is not possible on theoretical grounds and our experimental results corroborate this statement.

3. All the cyanides and cyanates such as allylisothiocyanate present in mustard oil volatilise at 150°C or about that temperature and quite a large amount of these deleterious substances get volatilised in the process of cooking and the remaining portion left will not be in a concentration sufficiently high to produce any toxic and poisonous effect.

A full account of the resu'ts of the feeding experiments carried on with animals, using mustard oils—pure as well as adulterated—along with their diet and also some accounts of the field experiments that have been carried on here are given below:

According to some, the occurrence of epidemic dropsy is due to poison present in mustard oil; the mustard seed is mixed with other seeds such as seeds of 'argemone mexicana' or 'sialkanta' as an adulterant which acts as poison. The mustard oil theory is also ill-defined in as much as no definite views have yet been advanced as to the nature or source of the substance in oil which causes the symptoms. The ex-



No. I

periments carried on by us (Palit and Basu, 1938) conclusively prove that mustard oil as obtained from healthy and pure mustard seeds (yellow variety) has nothing to do with the causation of the disease and is not responsible for epidemic dropsy at all. We have already shown on theoretical grounds that the cyanide theory does not seem to hold any ground and is not tenable. Now whatever be the loopholes in the cyanide theory, it cannot be discarded on mere theoretical grounds without studying experimentally the effect of cyanides on laboratory animals. However, we have made systematic investigations in this line with pigeons and studied the effect of different samples of oils containing different proportions of cyanides. The experiments were carried on as follows:

Feeding Experiments

Experiment No. I—In this experiment the pigeons were divided into four different groups, each group having four pigeons. The diet for each group per day was as follows:

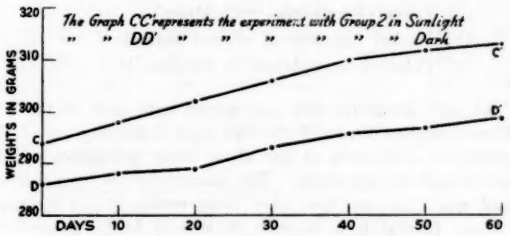
Group 1.—Bajra (Pennisetum typhoideum)—100 grams for four pigeons and boiled mustard oil free from hydrocyanic acid—1 c.c. to each pigeon.

Group 2.—Bajra—100 grams for four pigeons and normal mustard oil (unboiled)—1 c.c. to each pigeon. (1 c.c. of this oil=0·18 mg. of HCN).

Group 3.—Bajra—100 grams for four pigeons and mustard oil containing excess of HCN prepared by passing hydrocyanic acid gas in mustard oil—1 c.c. to each pigeon. (1 c.c. of this oil=0·22 mg. of HCN).

Group 4.—Bajra—100 grams for 4 pigeons and aqueous solution of HCN (dilute)—1 c.c. to each pigeon (1 c.c. of this HCN solution=0·18 mg. of HCN).

The oils and the aqueous solution of hydrocyanic acid were directly administered to the pigeons by opening their mouths with a pipette. Each of these experiments from group 1 to group 4 were divided into two different sets—one carried on in sun-light and the other in the dark, side by side, thus having eight groups



No. II

and using 32 pigeons. These experiments were started on the 2nd December, 1938 and then stopped on the 5th March, 1939. The pigeons in each group in sunlight as well as in the dark were weighed every tenth day and the change in their weights noted. The results of the average weights of the four pigeons are given below:—

Set No. A—Sunlight.

Groups—Average in grams of 4 pigeons taken every tenth day

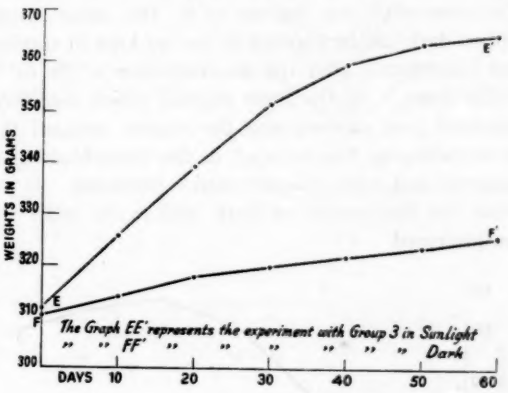
	At start—	10—	20—	30—	40—	50—	60—
Group 1. (Boiled oil)	—290—	300—	304—	308—	312—	316—	318—
Group 2. (Unboiled „)	—294—	298—	302—	306—	310—	312—	313—
Group 3. (Oil mixed with excess of HCN)	—312—	326—	340—	352—	360—	364—	366—
Group 4. (Solution of dilute HCN)	—308—	320—	328—	342—	348—	346—	342—

Set No. B—Dark.

Groups—Average in grams of 4 pigeons taken every tenth day

	At start—	10—	20—	30—	40—	50—	60—
Group 1. (Boiled oil)	—284—	285—	287—	288—	291—	292—	293—
Group 2. (Unboiled oil)	286—	288—	289—	293—	296—	297—	299—
Group 3. (Oil mixed with excess of HCN)	—310—	314—	318—	320—	322—	324—	326—
Group 4. (Solution of dilute HCN)	—312—	318—	320—	318—	320—	318—	316—

From the above experimental results, the graphs have been plotted (*vide* Graphs Nos. I-IV). In each of these feeding experiments in both the sets—*viz.*, in sunlight as well as in the dark—the average weights of the birds in all the groups with the exception of

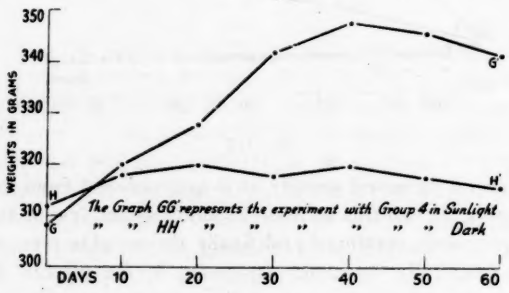


No. III

Group 4 increased steadily as is quite evident from the graphs, though this increase became less and less as the experiments continued and finally the weights remained practically constant. In group 4, the pigeons in both the sets at first gained their weights steadily for sometime and as the experiments continued, there was then a sudden drop in their weights, although this drop was not very great. From the graphs, it is also quite evident that the average weights gained by the pigeons in all the groups from 1—4 kept in the dark are much less than the weights in the corresponding groups kept in sunlight. This clearly shows that sunlight has a beneficial effect on the system and has got much influence on the healthy growth in animal and plant lives. None of the birds in any group in any set—sunlight or dark—developed any sign of disease suggesting epidemic dropsy and this is quite clear from the above

experimental results which show that the birds maintained steady growth and kept good health, the weights increasing steadily for some time and then remaining practically constant at the end.

Now in group 3 of both the sets in sunlight and in dark, the dose of the oil containing HCN was increased from 1 c.c. to 1·5 c.c. on the 20th January 1939 and continued for six weeks. No symptoms of any disease developed in any case except that there was a remarkable change in the colour of their stools which were bluish green. The dose of the oil was then increased to 2 c.c. on the 2nd March, 1939 and administered to three pigeons first kept in sunlight. All the three pigeons died one after the other within 5 minutes. The dose was not increased in the other group kept in dark, as the pigeons in the set kept in sunlight died immediately after the administration of the oil in double doses. All the three pigeons which died were examined post mortem and the results revealed that the metahæmoglobin detected in the heart-blood gave indication and signs of acute cyanide poisoning. It was found that the amount of lactic acid in the heart was also increased.



No. IV

Similar operations were conducted with group 4 in which aqueous solution of hydrocyanic acid was administered. Nothing happened when the dose of hydrocyanic acid was increased from 1 c.c. to 1·5 c.c., but when the dose was increased to 2 c.c. the results proved fatal. The post mortem examinations revealed the same results as in group 3, giving indications and signs of acute cyanide poisoning.

The poison appears, to a certain extent, to get absorbed in the system of the birds by the formation of non-toxic substances. When the limit is exceeded, acute cyanide poisoning occurs.. These experiments were stopped a little after 13 weeks which are held by some observers as the incubation period of the disease.

Experiment No. II—Another separate series of similar experiments were started on the 2nd February 1940, polished rice being substituted for Bajra in their diet, other conditions remaining the same as in the previous experiments described above. No symptoms of any disease or any remarkable change in their weights appeared. The respective dose of the oil and of the hydrocyanic acid solution was increased from 1 c.c. to 1·5 c.c. after a month. A number of casualties occurred in each of the Groups 3 and 4 in both the sets (sunlight as well as dark). A few of the dead pigeons were examined post mortem for their variation in tissue structure of heart, liver and kidney and the tissue culture results showed changes which did not accord with the symptoms of epidemic dropsy but only showed signs of acute cyanide poisoning. These experiments terminated on the 8th March 1940.

Expt. No. III—These experiments with pigeons were started from the middle of January 1940, with four different samples of oil which were collected from different places during the outbreak of epidemic dropsy in certain cities. The chief diet of the pigeons was as follows:

(*a*) Bajra (Pennisetum typhoideum)
(*b*) Karkal (mixture of several grains)
(*c*) Polished rice (devoid of vitamin B).

In each group the diet was mixed with each of the four different samples of the oil obtained from different places. The experiments with each of the above three substances as diet were carried on separately. The quantity of oil first administered was 1 c.c. and then after three weeks, it was increased to 3 c.c. Karkal is a mixture of several kinds of seeds or grains containing very small particles of limestone or kankar, and is the main diet of birds. These small pieces of lime-stone or kankar are taken by the birds with great relish along with the various seeds and these are nothing but calcium carbonate and supply calcium to the system. The other conditions were the same as in the two previous experiments already described.

All these four samples of the oil were found, on analysis to contain, 'argemone oil', as each of them gave distinct indication for the presence of 'argemone oil' detected by the nitric acid test; compare Chopra *et al*, (1940): also Stewart and Boyds, (1928). The following results were obtained:—

(*a*) This experiment (with bajra) was similar to Expt. I described before with bajra as the main diet. If any symptoms could develop, it must be certainly due to the presence of adulterated oil but no undesirable signs were exhibited. This experiment lasted for seven weeks and then terminated.

(*b*) In this experiment with 'Karkal', the same results were obtained as in the experiment (*a*) just described. After seven weeks, the experiment terminated without any positive result in favour of the cyanide theory.

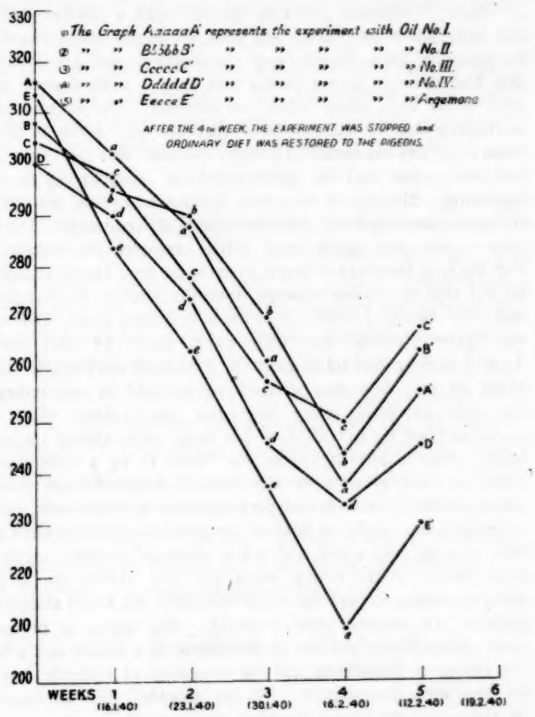
(*c*) In this series, the birds were fed with vitamin-free (polished) rice as their main diet mixed separately with each of the four different samples of the oil collected. A separate but quite a similar experiment was also started with birds using pure 'argemone oil' (1 c.c.) instead of the above oils, the diet and other conditions remaining the same. The experimental results show that after 10 or 12 days, several pigeons fed with pure 'argemone oil' got polyneuritis and developed symptoms of gastro-intestinal disturbances, while the other groups fed with the four different samples of the oil developed these symptoms a little later—in the middle of the third week. The results of this experiment are recorded below:—

Samples of oil.—Average weight in grams of 4 pigeons on the dates stated.

	16-1-40	23-1-40	30-1-40	6-2-40	12-2-40	19-2-40
1. Oil No. 1—	316	302	288	262	238	256
2. Oil No. 2—	308	296	290	270	244	264
3. Oil No. 3—	304	298	278	258	250	268
4 Oil No. 4—	300	290	274	246	234	246
5. Argemone oil (1 c.c.)	314	284	264	238	210	208

From the above results, the graphs have been plotted. The experiment was started on the 16th January 1940 and stopped on the 12th February 1940, when the ordinary diet bajra and karkal—was restored to them.

From the graphs (*vide* Graph No. V), it is quite clear that the pigeons fed with polished rice and several samples of the oils collected and the 'argemone oil', began to lose their weights quite steadily and this decrease in weight was very much marked after the second week. In each case there was a sudden drop in their weights and this drop was very high specially in the case with 'argemone oil' when the drop was from 264 grams to 210 grams in two weeks. In every case the pigeons went on losing their weights as the experiments continued and began to fall ill one after the other. Immediately the administration of the four different samples of oils as well as 'argemone oil' was stopped and their diet—polished-rice—was replaced by bajra or karkal along with calcium lactate and substances rich in vitamin B such as orange, sweet lemon,



No. V

tomato, etc., in serious cases. All the birds showed definite signs of improvement, began to gain in weight and recovered after a few days as will be evident from the graphs. There were no casualties.

These symptoms of polyneuritis and gastro-intestinal disturbances are evidently due to polished rice deficient in vitamin B and certainly not due to the oils. Polyneuritis in pigeons by polished rice has been definitely established long ago, since the administration of vitamin B concentrates indicates almost instantaneous improvements. The combination of rice with oil adulterated with 'argemone oil' makes a fertile ground for the development of epidemic dropsy.

Now we come to some of the actual cases of our field experiments carried on here, *i.e.*, the actual cases of persons suffering from an attack of epidemic dropsy commonly known as 'beri-beri' that we have come across and mention the system or the method of treatment

based on the results of our biological investigations that have been followed.

Case I.—Patient A—This patient was a washer-woman and aged about 50 years. She was, on examination, found to be suffering from severe cardiac complaints and eye-troubles. She had dimness in her vision and œdema with flushed rosy skin of the legs, which pitted on pressure. The spasms were so violent that it was expected that she would die of heart failure at any moment. History revealed the fact that she had also some sort of gastro-intestinal disturbances in the beginning. She was a very poor woman and could not afford to meet the expenses for her medical treatment. During spasms, she was given amyl nitrite capsules for inhalation. For the first few days, she was given some fruit juices (supplied by us) rich in vitamin contents, specially vitamin B (complex) and lime water (2 drachm) twice a day after food. She was also given freshly fermented palm juice (4 oz.) every 4 or 5 hours, the total quantity consumed during 24 hours being 24 oz. She was exposed to sunlight in the morning for half an hour every day and was rubbed olive oil (also supplied by us) all over her body while taking the sun-bath. After a few days, she was found to be a little better, when she was given some rice (bhat) prepared from freshly hand pounded rice with red pericarp over it, some milk, green vegetables and 'ghole' or 'mattah' prepared by churning curd and then diluting with water, and a few 'chapatis' or cakes prepared from bajra. After taking bajra and rice (bhat) for a few days, she began to improve remarkably and was found altogether quite a new woman after a month. She began to progress quite satisfactorily and within the course of a month and a half she recovered completely and the symptoms of epidemic dropsy or 'beri-beri' disappeared. All her troubles such as dimness of vision, œdema, heart troubles, etc., sub-sided. She is quite hale and hearty and is now attending to her profession.

Case II.—Patient B—This patient was the son of patient A and was a young man of 25-27 years of age. He had œdema of his legs and erythema all over the lower part of his body and abdomen. His face as well as his body became quite dark and looked quite flushed. He complained of constipation and had severe breathlessness due to heart trouble. The treatment that was followed was exactly the same as that of his mother (Patient A). This patient recovered quickly. He has had no further trouble since then and is now keeping good health and attending to his profession.

Case III—Epidemic dropsy or 'beri-beri' broke out in a Bengali family consisting of (*a*) himself, (*b*) his wife, (*c*) and (*d*) his two daughters and (*e*) his son. All of them had œdema of the legs with rosy skin, which became more prominent in the afternoon and the legs pitted on pressure. All of them had more or less, some sort of cardiac and eye complaints:

No. 1.—Two of them, the wife (No. *b*) and her eldest daughter (No. *c*) had large number of sarcoids all over the lower parts of their bodies. These patients complained that the stools they were passing were of corrosive nature. The mother developed piles and fissures from which blood was constantly oozing out.

No. 2.—The other three patients, the father (No. *a*), his youngest daughter (No. *d*) and his son (No. *e*) were a bit constipated and had been complaining of breathlessness due to heart trouble. Their cardiac complaints were not so severe as in the above two cases (No *b*) and (No. *c*).

The system of treatment that was followed was on the same lines as communicated in our previous publication (Palit and Basu, 1938):—

(*i*) Calcium lactate—15 grains twice daily to all the patients.

(*ii*) Acid Mixture—nitro-muriatic dilute or phosphoric acid dilute 15 minims twice daily after food.

(*iii*) Freshly fermented palm juice—4 oz. every 4 or 5 hours.

(*iv*) Exposure to the sun for half an hour in the morning. Each of them was rubbed with mustard oil all over the body while taking sun-bath.

(*v*) Exposure to ultraviolet radiation every day for 10-15 minutes at a distance of 3 ft. from the lamp all over the body excepting the head and face and also over the rectum in the case of mother (No. *b*) for 5-10 minutes from the same distance. For swelling and pain in the rectum she was prescribed the application of 'Hadensa' in the rectum.

(*vi*) Diet—sufficient quantity of milk and ghôle. Bhat (cooked rice) prepared from freshly hand pounded rice with red pericarp over it, green leafy vegetables such as 'Palang Sâk' (spinach olerace—Hindi Palak), Kalmi Sâk (ipomœa reptaus—Hindi Karmoha), Salad, Patal, (tricosanthis dioica—Hindi Parwal), Palta (leaves of Patal or Parwal), Dhenrosh (hibiscus esenlenties—Hindi Bhindi), bread prepared from whole wheat and the cakes prepared from bajra, meat, liver and fruit juices, like orange, grapes, sweet lemon, pine-apple, pomegranate, tomato etc. and also some irradiated (either by exposing to the ultra-violet radiations for 15-20 minutes or to the sunlight for 1-2 hours) fruits such as cucumber, shaddock (batapi lebu), oranges, and apple cut in thin slices. Mustard oil from bazar was totally avoided but the oil obtained from pure mustard seeds (yellow variety) from 'ghani' was freely used.

In several cases, the mother and her eldest daughter (Nos. b and c) were each given 'Makaradhwaj'—one grain with honey and extract of Arjun in the afternoon and were also given injections of calcium and 'beri-beri' vaccine every 4th or 5th day. The œdema of the legs and the sarcoids began to subside and finally disappeared. The swelling in the rectum (No. b) diminished and the inflamed painful piles also slowly subsided. The patient (No. b) became quite normal in the course of a month and a half or so. All the patients

recovered very quickly and gained much in weight. None of them had any further complication since then and all of them are now keeping good health.

Discussion

In our previous communication (Palit and Basu, 1938; Palit and Dhar, 1928, 1930 and 1932), the effect of sunlight on animal body has already been discussed. Palit and Basu have shown that the light absorbed by the system accelerates the metabolism of food materials in the body and that by the absorption of light, the body cells are activated and thus increased oxidation of food materials takes place. The diseases like 'beri-beri', epidemic dropsy, ricket, gout, anæmia and so on, which originates with defective metabolism of food materials should be prevented or cured by light treatment. Hence light acts as a preventive and the disease is thus avoided in its presence. The increase in the metabolism of food matrials is the most fundamental action of light which leads to the prevention and cure of diseases when a person is exposed to sunlight or ultra-violet radiations.

In the same communication, we have also discussed the importance of calcium and iron salts. The uses of calcium salts in many body reactions have been accepted as an important agent in counteracting infection and repairing the damage of the tissues caused by the disease. Moreover, it acts as a stimulant to the heart. In the treatment of metabolism diseases like 'beri-beri', epidemic dropsy, anæmia, etc., iron preparations specially of colloidal nature are found to be helpful and efficacious in the treatment of deficiency and metabolism diseases and the addition of minute traces of copper or manganese salts to this iron is also very helpful. We have already shown (1938) that common green leafy vegetables contain iron and hence, their usefulness in the prevention of deficiency diseases is not only due to the presence of vitamins in them but also due to their iron and other mineral contents. Recent researches (Palit and Dhar, 1934, 1935 and 1936) have shown that traces of copper or manganese are of great importance in many animal and plant processes. These minute traces of copper or manganese stimulate markedly the oxidation of food materials. Hence in the treatment of metabolism diseases or anæmia, the addition of traces of copper or manganese salts to iron is very useful.

All the experiments carried on by us, as described in this communication, prove that mustard oil as obtained from healthy and pure mustard seeds (yellow variety) has nothing to do with the causation of the disease and is not responsible for epedimic dropsy or the so-called 'beri-beri'. We have constantly used and have still been using pure and freshly prepared mustard oil in families afflicted with disease with no ill effect at all.

From the feeding experiments with pigeons mentioned in this communication, it is found that none of the birds developed any signs of disease suggesting epidemic dropsy. The sub-lethal doses of cyanides that were being administered into their system, were probably being converted into non-toxic and non-poisonous substances as already discussed in. Another probable reason for assimilating poison may be due to bajra itself which is the basic diet of the pigeons. Bajra contains some sulphur compounds, iron and calcium. The sulphur compounds as stated before form non-toxic compounds with cyanides. The glutathione, a sulphur compound present in animal system, is converted into disulphide form by its oxidation, thus:

$$2G{-}SH+O{=}G{-}S{-}S{-}G+H_2O, \text{ i.e., } 2G{-}SH+O \begin{matrix} =G{-}S \\ \quad | \\ G{-}S \end{matrix} +H_2O.$$

The disulsphide compounds such as cystin, etc., thus formed and also present in the system react with hydrocyanic acid forming non-toxic and non-poisonous substances regenerating the original substances glutathione or cystein, thus:

$$\begin{matrix} G{-}S \\ \quad | \\ G{-}S \end{matrix} +HCN=G{-}SH+GCNS,$$

where G stands for the radicle—$CH_2.NH_2.CH.COOH$ in cystein thus:

$$\begin{matrix} CH_2{-}S{-}H \\ | \\ CH.NH_2 \\ | \\ COOH \end{matrix} + \begin{matrix} H{-}S{-}CH_2 \\ | \\ O \\ | \\ HOOC \end{matrix} + \begin{matrix} S{-}CH_2.NH_2.CH.COOH \\ | \\ CH.NH_2{=}S{-}CH_2NH_2.CH.COOH \\ | \\ \text{Disulphide compound} \end{matrix} + H_2O.$$

(Cystein) (Cystin)

β—thio—α—amino-propionic acid. (Cystein)

and $S-CH_2.NH_2.CH.COOH$

$S-CH_2.NH_2.CH.COOH + HCN = CH_2.NH_2.CH.COOH$ (disulphide compound)

$S-H$ (Cystein) +

$CH_2.NH_2.CH.COOH$

CNS

(thiocyanate derivative)

Now the thiocyanate derivative GCNS is decomposed by dilute acid (hydrochloric) present in the stomach into carbonyl sulphide COS which in contact with water is immediately decomposed into carbon dioxide and hydrogen sulphide, the latter in turn forms hydrosulphide compound again or is oxidised by air into water with the precipitation of sulphur, thus:—

$GCNS + 2HCl + H_2O = GCl + NH_4Cl + COS$ ..(i)

$COS + H_2O = CO_2 + HS_2$ ..(ii)

and $H_2S + O$ (air) $= H_2O + S$ ..(iii)

The oxidation of glutathione into the disulphide form induces the oxidation of cell constituents as is shown by the fact that more oxygen is taken in than is required for the formation of the disulphide compound. It is also revealed by the investigations of Meyerhof and Hopkins that the tissues are also capable of effecting the reduction of the disulphide compound into glutathione, thus:—

$G-S$

$+ XH_2 = 2G-SH + X.$

$G-S$

nature of the compound XH_2 in the muscle tissues is not known yet. The glutathione is again converted as before into the disulphide compound and the disulphide again into glutathione so that the cycle is repeated.

Similar reactions occur with bajra and with karkal as well, which not only contains bajra but also many other varieties of other small grains, mineral salts, iron, and calcium. In groups 3 and 4 of the feeding experiments with pigeons, in which excess of cyanide is used, iron seems to play a very important part by combining with the cyanides introduced in the system and forming 'Prussian Blue' which is indicated by the bluish green stools of the birds. Calcium and iron as is evident from the results maintain this steady growth. The possibility of a reaction to form a non-toxic compound of the nature above is seen in the fact that the pigeons have a high rate of metabolism, their body temperature being about 112°F.

Moreover, it has been shown by experiments on pigeons that when 'argemone oil' is heated till it 'fumes' well, the toxicity of the oil greatly diminishes to that of bland oils like olive oil, although the heated oil still gives the positive test with nitric acid. It has been shown [(*a*) Chopra, *et al*, 1939; (*b*) Chopra, Pasricha and Banerji, 1939 and 1940] by the feeding experiments in man that the oil expressed from the seeds of 'argemone mexicana' along with milled rice as diet can produce signs and symptoms of epidemic dropsy and that the ætiological reason for the causation of the disease is the 'argemone oil' which is largely used as an adulterant of mustard oil. Chopra, Pasricha and their collaborators (1939) have found from their feeding experiments during an out-break of the disease that when rice and the mustard oil that gave positive test for the 'argemone oil' were each withdrawn from the diet and respectively replaced by bread and ghee, the disease disappeared and the patients recovered quickly. As far as rice used in diet is concerned, all the experimental results of the above investigators just corroborate the results which we have obtained and mentioned in this communication. But when these experiments are carried on with bajra omitting rice altogether, we did not find any sign or symptom whatsoever of the disease like epidemic dropsy although the oils containing cyanide and 'argemone oil' were freely used to a certain limit. Our experimental results conclusively prove that rice with mustard oil adulterated with argemone oil makes a fertile ground for the development of epidemic dropsy and when the rice and oil are omitted from the diet, the disease disappears. Moreover, from the results of our feeding experiments and the actual field experiments, we come to definite conclusion that bajra has preventive as well as curative properties and the disease is thus avoided. We can confidently say that whatever the ætiological reason for the causation of epidemic dropsy may be, the disease can altogether be avoided by taking 'chapatis' or cakes prepared from bajra and calcium with plenty of green vegetables and fruit juices rich in mineral salts, iron contents, calcium and vitamins specially vitamin B (complex). We are also of opinion that with the out-break of epidemic dropsy, vitamin deficiency is caused and not that the disease is caused by the deficiency of vitamins. Hence it is necessary to replenish the system with vitamins.

In the last epidemic, one of the authors (Dr. S. N. Basu, Chairman of the Medical Relief Committee) got the form (*vide* Appendix A) printed for the investigation of the causation of the disease. We requested Major D. N. Chakraburty, I.M.S. to help in the investigation and to carry on the work in collaboration and our request was gladly accepted by him. The Municipal Board was also pleased to help us in this investigation by offering the temporary services of an assistant chemist for a few months and by supplying us oils collected from different infected areas. The above form has been practically drawn up by Major Chakraburty. Unfortunately, he had to leave the work as no further help would be given by the Board and he had to leave India on active service. One of the authors (Dr. Basu) got the circulars distributed amongst the public and got pure mustard oil pressed from the yellow variety of mustard seed under the supervision of the Public Health Department of the Municipal Board, and sold at cost price to the public and to the patients. He also requested Mr. Venkatesh Narain Tewari, the Parliamentary Secretary to the Premier, to get a supply of pure unadulterated palm-juice just fermenting for the use of patients which was being supplied from the Public Health Office. Our information is that the toddy that is sold in toddy shops is adulterated with various ingredients to make it more intoxicating and so the use of toddy from toddy shops was prohibted by us; but we advocated the use of palm-juice just fermenting. The reasons why we advocate the use of just fermenting palm-juice are:—

(*i*) Palm-juice is nothing but pure glucose in solution in its natural form which is more easily absorbed in the system than chemical glucose solution which we give.

(*ii*) 'Just fermenting' means that vitamin B is being formed which we found to be very efficacious in toning up the heart, ameliorating the symptoms of pain and digestive troubles so often complained of by the patients suffering from epidemic dropsy. We used injections of vitamin B along with calcium injections with quite satisfactory results.

Pasricha and his collaborators (1936) claim to have discovered anti-bodies in the blood of epidemic dropsy cases against a gram-positive spore-forming bacillus isolated from their stools, while such antibodies are said to be absent in the healthy controls.

Recently we have been using 'beri-beri' vaccine prepared from the stools of 'beri-beri' patients by the Clinical Research Association, Ltd., Calcutta, with far better results than with calcium and vitamin B alone. The vaccine is very efficacious in gastro-intestinal disturbance cases.

In our opinion, the epidemic dropsy is nothing but a group of large number of various diseases. Hence no single treatment or causation can fit in for the disease. We request the other investigators to work on the line of (*a*) infection, (*b*) chemical poison and (*c*) metabolic deficiency. We also request them to keep their mind open and not to be carried away by any dogma.

In conclusion we offer our sincere thanks to Major D. N. Chakraburty, I.M.S., D.T.M. & H. for his results of the post mortem examinations of the dead pigeons carried on by him in his laboratory and hospital. We also offer our sincere and heartfelt thanks to Pandit Amaranatha Jha, M.A., F.R.S.L., the Hon'ble Vice-Chancellor of the University of Allahabad, to accord his kind permission to carry on this investigation at the Bio-chemical Laboratory of the University in collaboration with well qualified and experienced medical men. Our thanks are also due to the Municipal Board, Allahabad, for offering the services of an assistant chemist (as a temporary measure) for this investigation.

APPENDIX A

ALLAHABAD MUNICIPALITY

BERI-BERI AND EPIDEMIC DROPSY RESEARCH

Family Schedule

1. Patient:—(*a*) Name, (*b*) Caste, (*c*) Sex, (*d*) Age, (*e*) Diagnosis, (*f*) By whom (give name).

2. Name, address and occupation of the head of the family.

3. Number of persons in the family. Total (*a*) Sufferers. (*b*) Non-sufferers.

Ages (*a*) and (*b*)
Sex (*a*) and (*b*)

4. Dietetic habits of the family:—Vegetarian or Non-vegetarian. Intake of fruits or raw vegetables.

5. Names, ages and relationship with the head of the family, of sufferers and the duration of the disease:—

Name. Sex. Age. Relationship. Duration. Lapse of time after first case in the family.

6. Names, ages and relationship with the head of the family, of persons with previous attacks of the disease:—

Name. Age. Sex. Date of last attack. Present condition.

7. Visitors during last six months:—

Date of visit. Age. Sex. Beri-Beri or Epidemic Dropsy case—Yes or No. Beri-Beri or Epidemic Dropsy case contact—Yes or No. Present condition if known.

8. Number of rooms occupied by the family:—

Are the rooms particularly damp—Yes or No.

9. Any two or more sufferers living in the same room, give names if yes:—

Names. Were they sharing the same bed—Yes or No. Serial Number of their attack within the family.

10. Any history of sore throat and/or diarrhœa prior to or after the attack amongst the members of the family including the patient. Give details:—

Names. Sore throat—Yes or No. Diarrhœa—Yes or No. Duration prior to attack. Present condition.

11. Any particular history of gastric trouble or colic prior to or during the attack. Give details:—

12. Sanitary condition of the house (if possible give floor space per head available and state of ventilation). Also specify if there is water carriage system or served privy:—

13. Economic status. (Average income) per head *i.e.*, total income divided by the number of persons in the family, average feeding expenditure of the family:—

Total Income. Number of Members. Per head income (monthly). Total Expenditure on foodstuff. Remarks.

14. Source of rice (sample of rice alleged to have been consumed by the family prior to and during the attack to be sent for examination):—

Source. Quality—Atap or parboiled. Hand or machine milled. Duration of consumption prior to attack.

15. Method of rice storage adopted by the family.

Quantity of rice stored in the family at a time, particularly during the rainy season, and for how long and under what conditions:—

Quantity. How stored. How long.

16. Source of mustard oil. Supply samples of mustard oil used:—

Source. Name of Brand. Machine or hand pressed. Duration of consumption prior to attack.

17. Method of storage of mustard oil:—

Quantity. How stored. How long. Is it consumed raw —Yes or No.

18. Any other food material regularly stored by the family and had been consumed by the affected persons. Give details and forward samples if available:—

19. Are there any neighbours affected with the disease, if so give details. Do the two families visit each other frequently:—

20. Any recent history of sore throat or diarrhœa amongst neighbours or in families regularly visited. Give details with dates if known:—

21. Is there any history of a case in the same house prior to occupation by the family? If so, how long ago (give dates):—

22. Has any member of the family visited endemic areas or affected families. If so, give names with dates:—

23. Use of intoxicants *e.g.*, Ganja, Charas, Wine, Opium, etc. Give details if any:—

24. Any other points of interest (Here note details of points not mentioned above, also give details of the patients symptoms and treatment taken):—

Signature and Designation (of the person filling this form).

Date

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STUDIES IN PALEOPATHOLOGY

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Paleopathology is the science which deals with the diseases of the ancients. The term has been used for the first time by Ruffer during his studies of the Egyptian mummies for evidence of pathological conditions among the ancient Egyptians.

During my recent visit to Cairo, through the kindness of Prof. Barnard Shaw, the Professor of Pathology, Egyptian University, Cairo, I had been fortunate to examine under the microscope the tissues obtained from the mummy of Har-Mose, the Egyptian singer who died in the year 1490 B.C. The organs of this individual—lung, liver and intestines have been kept in a household box placed by the side of the mummy and lying there for the last 3,400 years. It is astonishing to find the histological characters so remarkably well preserved almost in their original state for this length of time particularly the collagen, unstriped muscles, fat cells, nerves, arteries, veins, etc. The cytoplasm of the cells stained well but the nuclei could not be demonstrated, nor the red blood cells. The cause of death of this individual was acute bronchopneumonia and pleurisy. Emphysema, old pleural adhesion, internal thickening of the superior mesenteric artery have also been observed.

The present study ranges over the period starting from the iron age to the remote antiquity extending to at least 150 million years.

For the purpose of this study the approximate ages of the different geological periods have been taken as follows:

Periods.	*Approximate age in millions of years.*
Pleistocene, Pliocene	30
Miocene, Oligocene, Eocene	60
Cretaceous	120
Jurassic	150
Triassic	180
Permion	240
Carboniferous	300
Devonian	420
Silurian	450
Cambrian	600

(After Dr. H. H. Thomas, F.R.S.)

HOLOCENE AGE (ENTIRELY MODERN FORMS OF LIFE)

This age is divided into—Iron age, Bronze age and Neolithic age. Starting from the most modern age we find from the studies of Shaltock and Ruffer regarding the pathological anatomy of the aorta of King Merneptah, the reputed Pharaoh of the Exodus. The sections of the aorta show the picture of typical senile calcification, the bony parallel, elastic lamelle being perfectly preserved and the interlamellar material thickly strewn with calcium phosphate. King Merneptah reigned in Egypt from 1225—1215 B.C.

Ruffer in his studies of the ancient Egyptian mummies found many pathological conditions in them; Potts' disease, smallpox, deforming arthritis of many kinds, tuberculosis, arteriosclerosis, fractures of many kinds, necrosis, caries, alveolar osteitis, tumours and other interesting lesions.

We have a series of medical papyri, that is, long rolls containing writings on medical subjects found in the Egyptian tombs that come from shortly after 2000 B.C. These are Kahun papyrus (1800 B.C.), Ebers papyrus (1500 B.C.), Smith papyrus (1500 B.C.), Hearst papyrus (1500 B.C.), London papyrus (1350 B.C.), and Berlin papyrus (1250 B.C.). The best known of these is the Ebers Papyrus. Certain portions of these papyri are much older and probably date from nearly 3000 B.C. There is scarcely a disease of any important organ with which we are familiar in modern times that is not mentioned here. While the significance of diseases of such organs as the spleen, the ductless glands and the appendix was, of course, missed, nearly every other pathological condition was either expressly named or at least hinted at.

6. Names, ages and relationship with the head of the family, of persons with previous attacks of the disease:—

Name. Age. Sex. Date of last attack. Present condition.

7. Visitors during last six months:—

Date of visit. Age. Sex. Beri-Beri or Epidemic Dropsy case—Yes or No. Beri-Beri or Epidemic Dropsy case contact—Yes or No. Present condition if known.

8. Number of rooms occupied by the family:—

Are the rooms particularly damp—Yes or No.

9. Any two or more sufferers living in the same room, give names if yes:—

Names. Were they sharing the same bed—Yes or No. Serial Number of their attack within the family.

10. Any history of sore throat and/or diarrhœa prior to or after the attack amongst the members of the family including the patient. Give details:—

Names. Sore throat—Yes or No. Diarrhœa—Yes or No. Duration prior to attack. Present condition.

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17. Method of storage of mustard oil:—

Quantity. How stored. How long. Is it consumed raw —Yes or No.

18. Any other food material regularly stored by the family and had been consumed by the affected persons. Give details and forward samples if available:—

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20. Any recent history of sore throat or diarrhœa amongst neighbours or in families regularly visited. Give details with dates if known:—

21. Is there any history of a case in the same house prior to occupation by the family? If so, how long ago (give dates):—

22. Has any member of the family visited endemic areas or affected families. If so, give names with dates:—

23. Use of intoxicants *e.g.*, Ganja, Charas, Wine, Opium, etc. Give details if any:—

24. Any other points of interest (Here note details of points not mentioned above, also give details of the patients symptoms and treatment taken):—

Signature and Designation (of the person filling this form).

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STUDIES IN PALEOPATHOLOGY

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Officer-in-Charge, Cholera Kidney Enquiry, Indian Research Fund Association.

Paleopathology is the science which deals with the diseases of the ancients. The term has been used for the first time by Ruffer during his studies of the Egyptian mummies for evidence of pathological conditions among the ancient Egyptians.

During my recent visit to Cairo, through the kindness of Prof. Barnard Shaw, the Professor of Pathology, Egyptian University, Cairo, I had been fortunate to examine under the microscope the tissues obtained from the mummy of Har-Mose, the Egyptian singer who died in the year 1490 B.C. The organs of this individual—lung, liver and intestines have been kept in a household box placed by the side of the mummy and lying there for the last 3,400 years. It is astonishing to find the histological characters so remarkably well preserved almost in their original state for this length of time particularly the collagen, unstriped muscles, fat cells, nerves, arteries, veins, etc. The cytoplasm of the cells stained well but the nuclei could not be demonstrated, nor the red blood cells. The cause of death of this individual was acute bronchopneumonia and pleurisy. Emphysema, old pleural adhesion, internal thickening of the superior mesenteric artery have also been observed.

The present study ranges over the period starting from the iron age to the remote antiquity extending to at least 150 million years.

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Periods.	*Approximate age in millions of years.*
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Cambrian	600

(After Dr. H. H. Thomas, F.R.S.)

HOLOCENE AGE (ENTIRELY MODERN FORMS OF LIFE)

This age is divided into—Iron age, Bronze age and Neolithic age. Starting from the most modern age we find from the studies of Shaltock and Ruffer regarding the pathological anatomy of the aorta of King Merneptah, the reputed Pharaoh of the Exodus. The sections of the aorta show the picture of typical senile calcification, the bony parallel, elastic lamelle being perfectly preserved and the interlamellar material thickly strewn with calcium phosphate. King Merneptah reigned in Egypt from 1225—1215 B.C.

Ruffer in his studies of the ancient Egyptian mummies found many pathological conditions in them; Potts' disease, smallpox, deforming arthritis of many kinds, tuberculosis, arteriosclerosis, fractures of many kinds, necrosis, caries, alveolar osteitis, tumours and other interesting lesions.

We have a series of medical papyri, that is, long rolls containing writings on medical subjects found in the Egyptian tombs that come from shortly after 2000 B.C. These are Kahun papyrus (1800 B.C.), Ebers papyrus (1500 B.C.), Smith papyrus (1500 B.C.), Hearst papyrus (1500 B.C.), London papyrus (1350 B.C.), and Berlin papyrus (1250 B.C.). The best known of these is the Ebers Papyrus. Certain portions of these papyri are much older and probably date from nearly 3000 B.C. There is scarcely a disease of any important organ with which we are familiar in modern times that is not mentioned here. While the significance of diseases of such organs as the spleen, the ductless glands and the appendix was, of course, missed, nearly every other pathological condition was either expressly named or at least hinted at.

6. Names, ages and relationship with the head of the family, of persons with previous attacks of the disease:—

Name. Age. Sex. Date of last attack. Present condition.

7. Visitors during last six months:—

Date of visit. Age. Sex. Beri-Beri or Epidemic Dropsy case—Yes or No. Beri-Beri or Epidemic Dropsy case contact—Yes or No. Present condition if known.

8. Number of rooms occupied by the family:—

Are the rooms particularly damp—Yes or No.

9. Any two or more sufferers living in the same room, give names if yes:—

Names. Were they sharing the same bed—Yes or No. Serial Number of their attack within the family.

10. Any history of sore throat and/or diarrhœa prior to or after the attack amongst the members of the family including the patient. Give details:—

Names. Sore throat—Yes or No. Diarrhœa—Yes or No. Duration prior to attack. Present condition.

11. Any particular history of gastric trouble or colic prior to or during the attack. Give details:—

12. Sanitary condition of the house (if possible give floor space per head available and state of ventilation). Also specify if there is water carriage system or served privy:—

13. Economic status. (Average income) per head *i.e.*, total income divided by the number of persons in the family, average feeding expenditure of the family:—

Total Income. Number of Members. Per head income (monthly). Total Expenditure on foodstuff. Remarks.

14. Source of rice (sample of rice alleged to have been consumed by the family prior to and during the attack to be sent for examination):—

Source. Quality—Atap or parboiled. Hand or machine milled. Duration of consumption prior to attack.

15. Method of rice storage adopted by the family.

Quantity of rice stored in the family at a time, particularly during the rainy season, and for how long and under what conditions:—

Quantity. How stored. How long.

16. Source of mustard oil. Supply samples of mustard oil used:—

Source. Name of Brand. Machine or hand pressed. Duration of consumption prior to attack.

17. Method of storage of mustard oil:—

Quantity. How stored. How long. Is it consumed raw —Yes or No.

18. Any other food material regularly stored by the family and had been consumed by the affected persons. Give details and forward samples if available:—

19. Are there any neighbours affected with the disease, if so give details. Do the two families visit each other frequently:—

20. Any recent history of sore throat or diarrhœa amongst neighbours or in families regularly visited. Give details with dates if known:—

21. Is there any history of a case in the same house prior to occupation by the family? If so, how long ago (give dates):—

22. Has any member of the family visited endemic areas or affected families. If so, give names with dates:—

23. Use of intoxicants *e.g.*, Ganja, Charas, Wine, Opium, etc. Give details if any:—

24. Any other points of interest (Here note details of points not mentioned above, also give details of the patients symptoms and treatment taken):—

Signature and Designation (of the person filling this form).

Date

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Moodie gives illustrations of the skin of a mummy of 1200-1090 B.C. with an eruption like that of variola and also of the skull of ancient Egyptian showing erosion due to a carotid aneurism. Another figure illustrating the ankylosed lumbar vertebra of an Egyptian mummy due to osteo-arthritis is also presented by him. Keith gives a picture the oldest known illustration of infantile paralysis from a Nineveh stele now between 3000 and 4000 years old.

In the neolithic sepulchral chambers discovered in 1908 on the side of a hill at Vendrest, some 50 miles to the east of Paris, in which no traces of the bronze or iron periods have been found, remains of over a hundred and twenty individuals were found. Keith mentions that no less than 8 of these skulls had been opened during life by the operation known as trephining. He further mentions that 5 skulls have been presented to the museum of the Royal College of Surgeons, England, showing how the operation of trephining is carried out by natives of New Ireland, one of the islands in the Bismark archipelago, to the east of New Guinea. Accompanying the skulls are the sharp obsidian flakes with which the operation was performed and the vegetable bandage which was applied to secure the dressing over the wound. He illustrates this by a drawing of the skull from a neolithic sepulchre in France which has been trephined in three places. It is evident that the patient has recovered from this daring operation in which extensive areas from the skull have been removed as the margins of the openings show evidence of healing.

All the trephining were done by scraping the bones with flint flakes . In volcanic regions like south Pacific Islands, obsidian—which is a natural glass—was used. Trephining by shell was probably never attempted by neolithic man in Europe, though primitive man in the South Pacific islands certainly used shell for this purpose, and shell knives and lancets for opening abscesses. Most of the cases were confined to the neolithic, and it seemed strange that this operation was rare during the succeeding epoch, the Bronze age, when finer instruments were available.

From a careful study of the neolithic trephining, it seems clear that there were 3 procedures employed—(1) the derived section removed by deep intersecting incisions, (2) by a process of scraping, (3) of encircling the site to be removed with a series of drill holes which are joined together to free the circumscribed area from the surrounding tissue. In these, the operation has been estimated to last approximately an hour. Frequently the subject fainted from pain and loss of blood and probably that served the purpose of anæsthetic. Opium might have been used for the purpose as this drug is mentioned in the Ebers Papyrus in Egypt. Modern Peruvians fill up the wound with powdered coca leaves which contain about 9% cocaine.

In Arabia this is even done without anæsthesia. Parry mentions the case of a girl who becoming restive and noisy, was only silenced into operative objection by a terrible outpouring of oaths and foul language administered by the operating surgeon himself.

Trephining was frequently performed by the ancient Peruvians. It is to be noted, says Sir Arthur Keith, that in neolithic France, ancient Peru, and in the new Ireland of to-day the same daring and difficult operation is carried out. Has each people discovered the practice for itself—or more probable was it not involved so long ago that it has permeated the whole stock of modern man? Keith is of opinion that it requires many thousands of years to move the whole world up a stage in civilisation.

Evidence of diseases during this period are overwhelming. It is of great interest to note the skull illustrated by Hrdlicka of an adult precolumbian male from the valley of the Chicama river, Peru, showing recovery from and the remains of symmetric osteoporosis in infancy.

Diseases in the Pleistocene Age (Most Modern Form of Life)

The pleistocene age includes Azilian age and the paleolithic (older stone) age and covers less than 30 million years. This is the age of Neanderthal man, Halting man, Gibraltar man, La Chapelle man, etc. Keith mentions that the Chancelade man belonging to the late paleolithic age had most of his upper teeth lost from disease; most of the lower teeth remained intact. The teeth had the peculiarity—the last molar was the largest and the first molar the smallest of the series, certainly a primitive proportion, for in most modern Europeans the order is reversed, the last molar being the most reduced in size and developed of parts. The Halling skull belonging to a paleolithic man, is not over

40 years of age, probably considerably under. For a man of this age the teeth were in a surprisingly bad condition. They were deeply worn. The enamel had disappeared by wear from the chewing surfaces of the crowns, exposing the dentine, and in some cases, the pulp cavities of the 6 molar teeth of the lower jaw, five had been lost from disease—not from caries, but from abscesses or gum boils forming at their roots. One of the premolar teeth had also perished before death.

The ear of Boskop man (in later pleistocene times) also shows disease of peculiar form. The roof of the middle ear, communicates with that of the skull. From the upper of the middle ear an outlet has been eroded to open on the hinder wall of the ear passage. La Chapelle man—a man of the Neanderthal race shows all the molar or chewing teeth lost from disease during life. (Keith)

Moodie mentions that the remains of the stone age men of Europe occasionally show evidences of disease and injury. One of the most interesting cases showing a stone arrow point embedded deeply in the visceral surface. The individual was shot through the abdomen and the arrow must have been coming with terrific force since it penetrated the abdominal wall near the umbilicus, ploughed its way through the vicera and embedded itself so firmly in the body of the vertebra that it has remained fixed after thousands of years. The individual might have died of peritonitis, or he might have died of some other cause, but there is no indication that he lived a great while after he was shot, since there is an absence of callus around the wound. He, illustrated a skeleton of an extinct buffalo or wild bull, as mounted in museum at Copenhagen, showing some rib injuries inflicted by arrow points of stone-age hunters. He mentions, further, that Raymond has described and figured cases of spondylitis deformans, arthritis of the knee, congenital luxation of the femur, fracture and repair of the femur with the formation of callus.

The most famous fossil man of this period is the Neanderthal man, the skeleton remains of whom have been found in Neanderthal in Prussia by Fuhlrott in 1857. From the excellent description of Shaafhausen we find that the proximal end of the left ulna has suffered from fracture of the forearm, which had healed with a widening of the articular fossa. The left humerus shows signs of an injury in consequence of which it remained much weaker than the right bone. Caries has been said to be evidenced on the occiput but this has been denied by Schwalbe. Other pathological processes found there, are alveolar fistulæ, necrosis and arthritides. Teeth are lost not from caries, but from abscesses (gum boils) forming at their roots.

The ancient woman of Eleringsdorf, must, in her youth, have been the subject of severe injury which knocked out the two right incisor teeth, and displaced the two on the left, for it will be seen that one of them has grown up in the middle line of the jaw while the other leans towards the left canine. The crowns of all the teeth are ground down, and there are the marks of numerous abscesses or gumboils at their roots (Keith).

Diseases in the Pliocene age (More Modern Forms of Life—30 Million Years)

The pliocene age is the age of Pithecanthropus, Neanderthaloids and the Rhodesian man.

Until the discovery of Rhodesian man we had always believed that caries of the teeth was a modern disorder, an ailment which civilised man had brought on himself by the artificial diet. It was, therefore, a surprise to find that this ancient man, with enormously strong jaws and big teeth, had suffered severely from dental caries, and we cannot doubt, from the pangs of toothache. Of the 16 teeth set on the upper jaw 10 are affected with this disorder. The remaining 6, including in this, the missing incisor, are worn but free from disease. At the roots of the molar and other teeth abscesses have formed and broken. On examining the teeth of wild chimpanzees which had lived and died in their native forests of tropical Africa, it is found that they also suffered from caries but only to a slight degree (Keith).

In the typical representative of Neanderthal man, the teeth, particularly the molar teeth, have undergone that peculiar specialisation known as taurodontism. This term is used because in general form there is resemblance to the molar teeth of the ox. Rhodesian man not only suffered from a severe degree of dental caries and dental abscesses, in his left knee joint is to be seen a lesser degree of rheumatic change, manifested chiefly by a lipping of the outer margin of the articular end of the tibia. The rheumatoid change in the knee may be a consequence of "oral sepsis". Some considerable

time before his death Rhodesian man received a severe wound, one inch above and in front of his left ear passage. The blow must have been given by a hard, sharp, pointed implement which left a perforation of the skull about one quarter of an inch in diameter. The edge of the wound is healed and the undercutting of the margin shows that the implement has been driven from without inwards. Certain trails on the surface of the adjacent bone suggest that pus had formed and tracked in several directions. There is a peculiar erosion in the hinder wall of the left ear passage large enough to take the terminal joints of a man's little finger. This eroded hole is of obscure origin, but it may have been caused by an abscess which tracked behind the ear from the wound in the skull (Keith).

Dr. E. Dubois discovered the remains of the oldest well-authenticated skeletal remains of man or man's precursors which he named pithecanthropus erectus, because, although it possesses the human erect posture, it yet possesses many ape-like traits. The discovery took place in 1891 in the central part of the island of Java. Thus pithecanthropus is called the Java man and represents the earliest man that ever lived on the surface of this earth. Naturally the available remains of this man has been extensively studied and from the point of view of our present study our attention is particularly drawn to the left femur which has been found entire and evidence of pathological condition in the form of exostoses.

This pathological condition has been studied by Rudolf Virchow and others. On the 14th December, 1895, a special meeting of the Berlin Gessellshaft fur anthropologie, Ethnologie and Urgeschishte was held under the leadership of Virchow to consider the remains of the Java man. Virchow read a paper in which he showed that the exostoses of the Java man was similar to exostosis in man of modern times which he illustrated by comparing with specimens of similar bone diseases from collections of the Berlin pathology museum (Moodie).

Diseases in the Miocene Age (30-60 Million Years)

The Miocene age is the age when no man was in existence, the age of cave bears, elephants, sabre-toothed tigers, etc.

As the first man has not come to exist in this earth we must seek for the pathological evidences in lower animals then existing. The cave bears supply us with a rich material showing evidence of pathological conditions. Moodie mentions that, Esper first noted in 1774 diseased condition in the fossils of cave bears and described the lesion as osteosarcoma which after restudy Mayer, regard as a fracture with necrosis and callus. Other specimens showed evidence of extensive enlargement with carious roughening and exostosis, arthritic necrotic sinuses, fractured rib, spondylitis deformans. Caries in the left mandibular ramus specially extensive in the alveolar fossæ and processes of the canine and molar teeth, resulting in extensive absorption of the processes, similar to the modern results of alveolar pyorrhœa. A lumbar vertebra shows caries due to tuberculous spondylitis. Various types of fractures and infections, indications of osteomalacia, atrophy and other pathological conditions are seen among these old cave animals which lived and died millions of years ago (Moodie). Apart from the cave bears, many interesting skeletons of wolves, elephants, sabre-toothed tigers, sloths and birds showed evidence of disease.

Diseases in the Eocene Age (60 Million Years)

Amongst the fossil animals of this age, the left radius of Daphænus faliness, a large dog—shows on the lower end a large exostosis, which is matched by a duplicate lesion of the other radius. The tibia, fibula and the tarsal bones of Limnocyon potens, an early carnivore, showed osteomalacia or some similar disease. These bones also showed considerable exostosis which may have been due to an infection of some duration or to nutritional disturbances. Fractures of numerous kinds are fairly common among fossil animals of this age and the evidence of healing is quite similar to those in the bones of our own days. Caries has also been observed in other animals of this age, *e.g.*, mastodon, fishes and also in one of the lower teeth of a Mosasaur, one of the large cretaceous reptiles. (Moodie).

Diseases in the Cretaceous and Jurassie Ages (60-150 Million Years)

In this age when mammals were not in existence and the world was ruled by the huge reptiles the dinosaurs, oligosaurs etc. the diseased processes were

not unknown. The bones of these gigantic reptiles were for the most part solid and fractures of these bones are always simple transverse breaks. Exostoses, necroses, tumours and other interesting lesions are to be seen among these cretaceous reptiles and among the preceding forms as far back in the carboniferous age when the first known evidences of disease are met with. Moodie gives illustrations of fracture of rib of a dinosaur.

Pott's disease has been found in the spine of the gigantic lizards, the dinosaurs, which animals are known to be extinct 100 million years ago. Thus Pott's disease was in existence in this earth hundreds of millions of years before the birth of Pott. Tumours are found on reptile skeletons buried in the rock chalk of Kansas and broken bones showing signs of bacterial infection have been found as far back as the Permian of Texas.

Microscopic Study of Ancient Lesions

Moodie describes that it is readily possible, by petrographic methods, to study the bone lesions microscopically as can be seen by referring to a drawing magnification 700 diameters, of a lesion due to osteo-periostitis in the humerus of an ancient reptile. Often in studying these ancient bones microscopically, one sees bacteria included within the lesions. These have been specially well studied by Renault, who has been able to demonstrate natural cultures of bacteria preserved in silicon.

Summary

A study has been made of the diseases of the ancients from the records of fossil animals extending over a period of more than 100 millions of years ranging from the modern age to the age of the giant reptiles when man and even mammals did not make their appearance on the surface of this earth.

Starting from the modern age, a study has been made of the description of the Egyptian mummies, skeletons found in the Neolithic sepulchral chambers, of Neanderthal man, Halling man, Gibraltar man, La Chapelle man, Boskop man, Rhodesian man, Java man, etc. It has been found that the individuals suffered from many pathological conditions *e.g.*, Pott's disease, small pox, arteriosclerosis, arthritis, fracture, necrosis, tumours etc.

In the prehuman age, the cave bears, wolves, elephants, sabre-toothed tigers, sloths and other animals show evidence of various forms of diseased conditions. Even the dinosaurs, which are known to be extinct 100 million years ago show evidence of Pott's disease, fracture, exostosis, tumours etc.

It is also seen that the nature of the diseases present in these prehistoric animals differ very little from that as seen in our own time.

It is, again, curious to find even bacteria well preserved in silicon as demonstrated by microscopical examinations of the fossil specimens.

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TREATMENT OF SYPHILIS

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Baghdad (Iraq).

Introduction

Years ago syphilis was thought to be an incurable disease, but now owing to the discovery of both modern schema (for the treatment of syphilis) and modern arsenical preparations free from impurities, syphilis is considered to be curable.

During my training I have found that Dr. Ross's schema succeeded in curing all primary and secondary and about 57 per cent of late syphilitic cases provided the patient attends regularly for treatment. His schema is based on scientific facts and on the result of his 25 years' experience in the treatment of venereal disease.

Until now there has not been an international agreement for a definite schema to be followed for the treatment of syphilis in V. D. hospitals or institutions, but every V. D. officer follows his own schema, with the result that a large number of badly treated primary syphilitic cases develop "treatment resistance".

METHODS USED FOR TREATMENT OF EARLY SYPHILIS.

(1) *Fildes and Parnell* made their investigations at the Royal Naval Hospital, Haslar, during the year 1917-1919. (*a*) No. 1 Course consists of six doses of "914" at intervals of 3 days, each dose 0·45 gm. (*b*) No. 2 Course consists of intravenous injection of "914" at four days intervals, the dose being 0·45 gm. and 0·6 gm. alternately. A total of 4·2 gm. of the arsenical was given. No second course was given unless there was a serological relapse.

It is important to bear in mind that these workers conducted this research during the transition period and before the advent of bismuth. For statistical purposes the cases were classified into A, B, C, and D cases.

An 'A' case was a man with an inoculation lesion in whom the Wassermann reaction had not yet become positive. A 'B' case was a man with an inoculation lesion or with a history of an inoculation lesion, but with no other outward signs or history of general infection except glandular enlargement and a positive W. R. up to and including eighteen months from the date of infection. A 'C' case was a man with outward signs or history of general infection including a positive W. R. upto and including eighteen months from the date of infection. A 'D' case was a man with or without symptoms or signs for eighteen months.

Result of treatment

Type	Total Cases	No. Negative	No. Positive
A	44	44 (100 p.c.)	0 (0 p.c.)
B	128	98 (79 p.c.)	30 (21 p.c.)
C	144	102 (71 p.c.)	42 (29 p.c.)
D	29	8 (28 p.c.)	21 (72 p.c.)

(2) *Course of treatment adopted at the St. Thomas' Hospital, London, until February, 1928:*

Day	Arsenobenzene Co. gm.	Hg. gr.	Bi. gm.
1 ..	.. 0·45	0	0
8 ..	.. 0·45	1	0·4
15 ..	.. 0·45	1	0·4
29 ..	.. 0·6	1	0·4
36 ..	.. 0·6	1	0·4
50 ..	.. 0·75	1	0·4
57 ..	.. 0·75	1	0·4
78 ..	.. 0·75	1	0·4
85 ..	.. 0·75	1	0·4
92 ..	.. 0·75	1	0·4

Potassium iodide is given from the 57th to the 78th day. Total 6·2 gm. arsenobenzene co. and 9 gr. Hg. or 3:6 gm. bismuth are given.

The following table shows the results of treatment at St. Thomas' Hospital, London, in the Clinic supervised by Col. L. W. Harrison (1929) and recognised as the standard treatment centre in England.

Type	Total Cases	No. Negative	No. Positive
A	115	109 (95 p.c.)	6 (5 p.c.)
B	120	104 (87 p.c.)	16 (13 p.c.)
C	167	111 (66 p.c.)	56 (34 p.c.)
D	538	83 (15 p.c.)	455 (85 p.c.)

In considering the treatment of any disease especially syphilis, the earlier the treatment is instituted, the minimum damage the tissues or organs receives, and the more hope there is in eradicating the disease. The drugs used for the treatment of early syphilis are arsphenamine series and also bismuth and its salts. Bismuth has replaced mercury in the treatment of early syphilis as it is less toxic. Iodides are of little value for the treatment of early syphilis, and only worth trying in resistant cases or in cases of intolerance to arsenic.

Action of arsphenamine series and bismuth: Arsphenamine has a rapid, powerful and destructive effect on Spirochæta pallida but only for a very short duration, and therefore to keep the organisms under constant action of the drug the injections must be given at an interval of not more than 4 days (usually given twice weekly) during the course of treatment. Arsenical injections should always be supplemented by injections of 0·1 gm. bismuth given concurrently. The action of bismuth is firstly spirochæticidal and secondly inhibitory to the multiplication of the spirochæta. It is less powerful than arsenic but its action is more prolonged and especially a 'depot' of it in the tissue has a pronounced and prolonged effect. For this reason bismuth is given by injection in preference to bismuth tablet given per os and also because the patient might take his tablets irregularly or in larger doses as to cause intoxication.

(3) *A. O. Ross's Schema:* (A) The following course is given to primary, secondary and early latent syphilitic cases.

1. In order to keep the S. pallida under constant action of the drug and to prevent "treatment resistance" N.A.B. (914), must be given twice weekly during the course of treatment in doses of 0·3 gm. and 0·45 gm. alternately.

2. 0·1 gm. bismuth intramuscularly is given in conjunction with N.A.B.

3. Each course consists of 12 injections of both N.A.B. and bismuth and it is completed in 6 weeks' time.

(B) The following course is given for late syphilitic cases. Sod. Iodide 2 gm. intravenously in 10 per cent solution of distilled water and Bi. 0·2 gm. twice weekly for six weeks. If W.R. of C.S.F. is negative trivalent arsenical compound such as N.A.B. is given twice weekly and if positive, pentavalent arsenical compound is given in the following way:

1st course	..	12 injections of tryparsamide,				rest 3	months
2nd course	..	12	„	„	„	„ 6	„
3rd course	..	12	„	„	„	„ 6	„

After this one course is given a year for the rest of his life. In case of parenchymatous neuro-syphilis with paretic gold curve, malaria therapy is indicated.

Oxycyanide of mercury and atropine in dose of 0·0005 gm. daily for 50 injections is very useful for gastric crisis, lightening pain and optic atrophy.

The following particulars must be noted, *viz.*, N. A. B. is dissolved in recrystallised 10 per cent. sod. thiosulphate since this solvent seems to prevent erythema of the ninth day; bismuth must be given in conjunction with N. A. B. and can be given in various forms, namely, bismostab, bisoxyl, bisglucol and bivatol; N.A.B. must be given slowly and not too concentrated as this minimises to a great degree the toxic effect of N. A. B. on the liver; there should not be allowed an interval of more than 4 days between the injections.

It will be seen that this course of treatment occupies 6 weeks as against 120 days in the course used at St. Thomas' Hospital, London, upto 22nd February, 1928. The shortness of this course is of great value, especially in the case of seamen. A statistical survey was undertaken of regularly treated cases at the Seamen's Dispensary during the years 1926-1939 with regard to their W. R. after 3 months and on several occasions later on. For statistical purposes the cases were classified as follows:

(*a*) Sero-negative primary cases, (*b*) Sero-positive primary cases, (*c*) Clinical secondary, (*d*) Late or tertiary, (*e*) Cured cases, *i.e.*, those which received regular courses (3 or more) and whose W. R. were always negative, 3 months after the first course and on several occasions later and remained negative for further 2 years after treatment and whose C.S.F. were also normal, (*f*) Serological relapse cases occurring only in later syphilitic cases who received previous to their attendance irregular treatment and where the C. S. F. were positive.

The result of the treatment is as follows:—

Type	Total cases	No. cured	Serological relapse cases.
A ..	282	282 or 100 p.c.	None.
B ..	232	232 or 100 p.c.	None.
C ..	126	126 or 100 p.c.	None.
D ..	277	158 or 57 p.c.	119

Points to be noted are: (1) W. R. of 62 out of 119 serological relapse cases in type D became negative at the end of their treatment. (2) The above results prove therefore that such schema succeeded in curing all cases which fall in groups A. B. C. and 57 per cent of group D. Cured cases in group D are mostly those whose C. S. F. are normal. (3) There were found no clinical or serological relapse in those cases who received 3 courses regularly, and that also is proved by the fact that every case of late or neuro-syphilis, who comes for treatment to any municipal hospital in Liverpool, is reported to Dr. Ross, so that he can find whether such cases were treated by his schema or not. Upto the date of writing no patient who received intensive treatment has been admitted as a case of late syphilis to any of the controlled hospitals.

Statistical survey of irregularly treated cases and those who received one regular course.

Type	Total cases	No. of cases who received	
		One course	Irregular treatment.
A ..	705	213	492
B ..	480	160	320
C ..	258	85	173
D ..	1049	281	762

Points to be noted are: (1) In Seamen's Dispensary we are dealing with a civilian population, for the most part seafaring, and consequently defaulters are many. (2) About 30 per cent of those who received one course, reappeared after 3 months for testing their W. R. and were found always negative except a few

cases of late syphilis. (3) In Col. Harrison's cases the blood is taken for the second time to observe the result of treatment at a time varying from the fourth to the fifth month after commencement of treatment. At Seamen's Dispensary the second blood is taken immediately prior to the second course of treatment, *i.e.*, about four and a half months after the first blood test. There is no question as to the system which gives the better results.

I would like to draw attention to the importance of regular attendance. I have found six cases in group B. & C. showing serological relapse and that was due to the following causes:

(*a*) Two cases relapsed because they received the second course of injections at irregular intervals, *i.e.*, they attended once every seven to ten days for treatment instead of twice weekly.

(*b*) Three cases attended for treatment after completion of the first course, but returned three years later and in spite of further regular courses, they showed serological relapse.

(*c*) In one case of sero-positive primary syphilis S. pallida were discovered by dark illumination from his primary sore. His W.R. was positive and urine contained albumen and so no bismuth was given during his first course of treatment. His blood when re-examined three months after the first course remained positive. This proves that heavy metal must be given in conjunction with N.A.B.

Toxic Effects and N.A.B. (914)

During my statistical work I found that very few cases treated by N.A.B. showed toxic effects. The toxic effects which I found were:—(1) erythema, (2) dermatitis, (3) jaundice and (4) neuritis. No cases of encephalitis hæmorrhagica, agranulocytosis, acute arsenical hepatitis or nitritoid crisis were found.

Patients who developed dermatitis were mostly due to idiosyncrasy of the skin to arsenical compounds and this was mostly found in 4 types of patients, *viz.*, those with pre-existing dermatitis, septic foci especially oral sepsis, highly strung nervous system and history of alcohol addiction. Jaundice was always found to be mild, constipation or gastrointestinal toxæmia being probably predisposing factors. The following measures were taken as a routine in every case to minimise the toxic effects of antisyphilitic drugs:

1. The patient must stop taking alcohol. 2. Examination of urine is made for albumen and bile. 3. Examination is made of every patient before each injection, including inspection of his skin and mouth. He is also questioned about his well-being, weight, fainting attack, nausea, itching of the skin, pruritus, pain in or bleeding from the gum. 4. Attention in detail to the preparation, and administration of the drug is the most important. It is never given too concentrated nor too rapidly and further the solution is injected within a short time after preparation. 5. No arsenical compounds are given where there is heart disease, liver disease, severe nephritis, advanced diabetes, Addison's disease or idiosyncrasy to arsenic, *etc*. 6. Glucose is given orally 2 hours prior to the injection.

Summary:

1. Out of 3,409 cases in Seamen's Dispensary during the last 14 years only those who have been intensively treated showed excellent therapeutic efficiency in primary and secondary syphilis. No case of primary or secondary syphilis treated by the method advocated had relapsed serologically or clinically.

2. Cases of late syphilis have been rendered serologically negative in high proportion without recourse to pyrexial treatment.

3. Relapses usually are common in irregularly treated cases and such cases can only be cured with great difficulty.

4. Shorter period of time is required for treatment and comparatively long intervals between courses of treatment enable seafaring men to complete a voyage before returning for a further period of treatment ashore.

Note: Dr. A. C. Ross is responsible for this method of treatment and to him,I render my thanks for permitting me to use the records at the Seamen's Dispensary.

References

1. Fildes and Parnell (1919)—Special Report Series No. 41.
2. Harrison, (1929) Special Report Series No. 132.
3. Prebble, (1933)—*Brit. J. Ven. Dis.*, 9:·125.

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CATARRHAL JAUNDICE

The incidence of catarrhal jaundice is common in this country, but the disease in majority of cases takes such a mild course that it has never been regarded seriously by the public as well as the physicians. Children are mostly affected, although the susceptibility becomes less and less as the age advances. In most of the cases the jaundice and bile in the urine disappears within a few days. In more pronounced types, however, the clinical syndrome is ushered in with a sense of weakness, followed by fever, but as the fever is usually slight and lasts for a short time, the malady is attributed either to cold in the head, on account of persistent headache lasting for two or three days or to the chill of the stomach and liver, on account of the symptoms arising from their disorder. The patients suffer from nausea, anorexia and even vomiting and diarrhœa in some cases and the liver becomes slightly enlarged and tender. The jaundice appears during convalescence in mild cases, as the concentration of bilirubin takes some time to go over 4 units of van den Bergh for the jaundice to become manifested in the conjunctiva and the skin. In more severe cases, the initial fever is rather high, the jaundice appears more quickly and the liver becomes enlarged from two to three fingers and tender on palpation. Although the stools become clay-coloured at first, the colour of the bile returns quickly. The feeling of prostration persists for a week or two although the fever does not persist for more than two or three days.

The etiology of the disease is yet unknown. The patients seldom die of this disease and autopsy was done only in a few cases. In these cases, post mortem findings showed damage of the liver cells, with no obstruction or catarrh of the bile ducts. It was Virchow who first suggested that the disease was primarily due to catarrh in the duodenum involving the bile duct at its junction with it. But Professor Richard Baur of Vienna thought that the so-called catarrhal jaundice was really associated with true degeneration of the liver of a very mild type. It was expected that in true degeneration of the liver, its function would be affected, but Hurst and Simpson(1) found that levulose tolerance test was normal in nine out of ten cases of catarrhal jaundice, whereas it was always abnormal in primary hepatic necrosis. Richard Baur, however, found that the galactose tolerance test was abnormal in every case of catarrhal jaundice. He showed that levulose test was much less sensitive than galactose test and unless the damage of the liver was extensive, levulose test failed to detct it.

Hurst and Simpson thought that the catarrhal jaundice could be divided into two different diseases, the first was purely of obstructive type due to involvement of the duct of Vater in the primary gastroduodenal inflammation associated with swelling of the lymphoid tissues of the duct, in which the chief symptoms were loss of apetite, nausea, epigastric pain and discomfort, furred tongue and even diarrhœa. The other is true

(1) Report of the Guy's Hospital, 1934.

hepatic necrosis of mild type, in which the toxæmic symptoms predominate. The tenderness is not shown in the epigastric region, but in the liver and the gall bladder. The liver and spleen are enlarged and there is slight fever. Headache and lassitude are prominent symptoms in addition to gastric ones. In this type jaundice is less marked than that in the first type.

It must be understood, however, that obstruction of the bile ducts with cholengiectasis usually brings about parenchymatous necrosis in the central zone of the lobules, which also occurs primarily in acute necrosis of the liver, where there is no obstruction of any kind. There is therefore no pathological evidence in the liver by which the two different forms, if any, can be distinguished.

At a discussion in the section of the Epidemiology and State Medicine of the Royal Society of Medicine (2), Culliman laid importance on the infective nature of the disease and found close relationship of common infective jaundice to acute and subacute necrosis of the liver, as the symptoms and the post-mortem pathological appearances were identical, and he considered that the causes were identical too. He also discussed the relation of common infective jaundice following injections of arsphenamine and suggested that the causative factor of both was the same, but the greater severity of the clinical symptoms suggested that syphilis and salvarsan were supporting agents, which rendered the liver more susceptible towards the origin of the disease, especially during the epidemic. In a recent paper (3), Findlay, MacCallum and Murgatroyd produced evidence to show that an extragenous hepatotoxic agent added to yellow fever vaccine prevented jaundice as well as yellow fever in 2000 people vaccinated. This extragenous agent has many of the characters of a filtrable virus and they postulated that it was identical with the causative agent of common infective jaundice. In the discussion that followed Culliman's lecture (2), Dr. J. A. Clover suggested that there was a second type with short incubation period, in which tonsilitis was often a predominant symptom.

Anyhow, until the causative agent is identified and isolated, uncertainty about the number of conditions included under the name of infective jaundice will continue.

(2) Proceedings of the Royal Society of Medicine, March 24, 1939.

(3) Transactions of the Royal Society of Tropical Medicine and Hygiene, 1939.

NOTICE

Branches and members are requested to preserve the Annual Report of the Association for 1939-40 which contains a list of members, corrected upto 30th September, 1940. In future, only additions and alterations to this list will be made available to members and branches to make this list up-to-date.

P. B. MUKERJI
General Secretary, I. M. A.

CURRENT MEDICAL LITERATURE

MEDICINE

Recent Advances in Treatment In Medicine

Moore (*Practitioner*, 1940:145:213) gives under the following heads the account of the recent progress in treatment in general medicine:

Chemotherapy—*Sulphanilamide* is believed to act in the body by inhibiting the metabolic process of bacteria and placing thereby the natural defence forces of the body in the optimum position for destruction of the invading bacteria. To prevent nausea and vomiting caused by sulphapyridine the drug is advised to be given in the form of an emulsion in mucillage of tragacanth combined with 30 to 50 mgm. of nicotinic acid for each dose. Sulphathiazol has been found efficacious in staphylococcal infections, specially of the urinary tract and though it is less toxic and causes less nausea and vomiting it produces hæmaturia and cast in the urine. *Anti-syphilitic preparations.* The oral use of sobisminol (administered in daily doses presenting 0·84 gm. of elemental bismuth and even prolonged for months without producing toxic symptoms) has been found effective not only in active syphilitic skin lesions but also in neurosyphilis including locomotor ataxia. Mapharsen has been also found effective, being least toxic. Neoarsphenamine dissolved in 5 per cent glucose given by continuous intravenous drip method (4 gms. given over 5 days) has been used with success by Hayman *et al.*

Deficiency diseases—*Hypoprothombinæmia.* The administration of vitamin K, natural and synthetic with desicated bile or bile-salts raises the plasma prothrombin level and is helpful in bleeding associated with obstructive jaundice and in hæmorrhages in the new-born. Banked citrated blood loses its prothrombin content as time advances and transfusion with such blood may be supplemented by vitamin K administration in cases mentioned above. *Vitamin B deficiency.* Encephalopathic syndrome alone or in association with pellagra, polyneuritis or scurvy (characterized clinically by clouding of consciousness, cogwheel rigidity of the extremities and uncontrollable grasping and sucking reflexes) when treated with nicotinic acid orally and parenterally improve effectively (mortality reduced to 31 per cent from almost 100 per cent). *Male sex hormone deficiency.* Testesterone propionate has been found effective in cases of hypogonadism in man and in "male climacteric" causing symptoms of involutional melancholia occurring in men of middle age. Cases of hypogenitalism with or without cryptorchism has been successfully treated with 50 to 100 units of gonadotrophic principle of pregnant mare's serum thrice weekly. *Adrenal insufficiency.* Desoxycorticosterone given intramuscularly in daily doses of 6 mgm. (10 to 25 mgm. during crisis only) is quite effective in Addison's disease (with salt intake not exceeding 5 gm. per day in addition to what is already contained in the food and the potassium content not less than 4 mgm. daily). Corticosterone may also be used as a pellet by implantation (a single implantation of pellets each containing 125 mgm. will be sufficient for nine to twelve months). *Pituitary insufficiency.* Improvement has been recorded in cases of pituitary dwarfism by intramuscular injection of antuitrin G (5 c.c. twice weekly). In neuromuscular atrophy remarkable results were obtained by *vitamin E* (10 minims of wheat-germ oil thrice daily) supplemented by vitamin B complex in cases of muscular distrophies and amyotrophic lateral sclerosis.

Blood transfusions—The rate of transfusion should never exceed 1 c.cm. per pound of body weight per hour and only half this rate if anæmia is severe. Excellent results have also been obtained by transfusion of plasma or serum instead of blood for wound, postoperative and burn shock. Plasma can be dried and the resulting powder can be kept stored indefinitely and when redissolved in sterile distilled water is apparently comparable to a transfusion with whole blood in its anti-shock value (no grouping is necessary).

Cardiovascular disease.—*Thrombosis.* Heparin has by several clinicians been used successfully by continuous intravenous method to prevent or control thrombosis. Successful cases of post operative pulmonary embolism have been reported also. When it is desirable to restore the original blood coagulation time when heparin is being used it may be necessary to use protamine sulphate intravenously. Cases of *subacute bacterial endocarditis* have been treated with remarkable results by concurrent use of heparin and sulphapyridine (3 out of 6 cases recovered). *Hyperpiesia* seldom responds to drug therapy as is evidenced from the fact that out of thirty-three drugs used, only six, *viz.*, bismuth subnitrate, iodine and iodide, bromide, sodium luminal, theominal and potassium thiocyanate showed some effect and that only in giving symptomatic relief.

Gastro-Enterology—Transentin (diphenylacetyldiethyl aminoethanol) has been found useful as an antispasmodic in such conditions as peptic ulcer, hypertrophic gastritis with pylorospasm, cholecystitis, diarrhœa and colonic spasticity. In *peptic ulcer* success has been achieved by colloidal aluminium hydroxide given by mouth or by the intragastric continuous drip method (daily dose of 500 to 1000 c.c. of a 2 per cent solution). Nasal insufflation of posterior pituitary powder produced satisfactory clinical results in a series of 67 out of 76 cases of peptic ulcer. Hydrated trisilicate of magnesium has also been found effective as an efficient neutralizer of free hydrochloric acid in such cases. Nickel pectinate is of value in controlling the diarrhœa of dysentery and of ulcerative colitis.

Miscellaneous—Prostigmin in peripheral vascular diseases, low-temperature or 'refrigeration' treatment for relief of pain in cancer, nicotinic acid in Vincent's angina, vitamin B in trigeminal neuralgia, epanutin in epilepsy, liver extract in idiopathic ulcerative colitis, codliver oil and hypertonic sodium

sulphate dressings and sulphanilamide powder for treatment of wounds, operation of the removal of the pericardium over a part of the left ventricle in cases of chronic constrictive pericarditis are some of the many new advances made recently. ,

Pyrexia Of Unknown Origin

Douthwaite (*Guy's Hosp. Gaz.*. 1940:54:228) in discussing the methods of investigating those patients whose presenting and probably only symptom is that of a raised temperature lasting for at least a week without the development of physical signs to explain its occurrence, writes that the following in descending order of importance comprises the correct mode of approach, *viz.*, history taking, examination, blood count, bacteriology including agglutination tests and x-rays. The first definite symptoms is usually all important in at least locating the area of the body at fault, *e.g.*, the boil preceding staphylococcal fever, the sore-throat in streptococcal fever, and the often transient vomiting and epigastric pain in acute appendicitis, etc. In physical examination the author stresses the importance of seeing the whole surface of the body and palpating for enlarged glands, tender points in muscles and subcutaneous tissues or bone, rectal and vaginal examinations with the aid of a speculum and special observations for signs of hyperthyroidism. Blood count showing a polymorph leucocytosis excludes a big group of causes of pyrexia, *e.g.*, typhoid, paratyphoid, tuberculosis (except probably the miliary form), influenza and malaria. Leukæmia, glandular fever, and pernicious anæmia may be diagnosed by careful blood examination. After the first ten days of fever agglutination tests specially for the typhoid group may be invaluable and much earlier in the disease bacteriological examination of the blood, urine and fæces may clinch the diagnosis. X-rays are invaluable in pulmonary tuberculosis. The author gives the following classification of causes of prolonged fever: (*a*) *endocrine*—hyperthyroidism, obessity in certain cases, pyrexia continuing for many months in children who have been immobilized for some pyrexial illness fall under this group; (*b*) toxic-growths and drugs are the important members of this group and of the latter the following may be mentioned, *viz.*, phenobarbitone, alcohol and amydopyrine; (*c*) cardio-vascular—cardiac infarction, leukæmia, agranulocytosis and pernicious anæmia produce prolonged fever and cause diagnostic difficulty; (*d*) cerebral—apart from organic lesions which are obvious, anorexia nervosa, nervous pyrexia and malingering are the cases which put one to difficulty in diagnosis; (*e*) infective—Cabot's analysis of 1000 cases of long continued fever showed that 92 per cent were due to typhoid, tuberculosis or sepsis. The author's analysis of 89 cases shows infection in 73 per cent only. The author concludes by stressing on the fact that pyrexia of unknown origin usually proves to be due to common infection and that failure to recognise it nearly always arises from lack of appreciation of the significant points in the history of the disease.

Accidental Acute Carbon Monoxide Poisoning

McMichæl and Ruskin (*Lancet*, 1940:2:679) write that accidental carbon-monoxide poisoning may become common from the rupture of gas-mains by bombs, from exposure to explosive gases and from fires in inefficiently ventilated shelters. Symptoms are increasing headache, dimness of vision, hyperpnœa, confusion. giddiness and vomiting and collapse often follows removal to the open air. Withdrawn blood may look pink but the patient is pale. History is of prime importance in diagnosis. Complications and sequelæ include mental impairment, tachycardia, electro-cardiographic changes, glycosuria and pulmonary lobular collapse often leading to bronchopneumonia. Treatment consists of removal from the poisoned atmosphere, administration of oxygen and carbon-dioxide and warmth. Complications may require lengthy aftercare.

Pneumococcal Meningitis Since the Introduction of M. & B. 693

Coleman (*Lancet*, 1940:2:615) gives a summary in a tabular form of the most of the published cases of pneumococcal meningitis treated with sulphapyridine and further reports one case from his personal experience. He observes that M. & B. 693 has reduced the case mortality from close on 100 per cent to about 35 per cent, that there is no reliable clinical evidence that antipneumococcal serum is of any value in a straight forward case. He further observes that to be effective sulphapyridine should be given in large doses at the outest at least 6 gm. a day for the first 4 or 5 days after which the dose may be decreased, that the drug should be continued in decreasing doses for atleast a week after the temperature has become normal and that frequent lumbar punctures should be avoided except when it is indicated for the relief of the patient. Cases proving resistant to treatment are either due to a strain of pneumococcus insensitive to M. & B. 693 or to a strain which has become tolerant to the drug.

Medical Application Of Ultraviolet Radiant Energy

Krusen (*Ann. Int. Med.*, 1940:14:641) writes that ultraviolet irradiation has been used extensively but indiscriminately in the practice of medicine and he mentions the following conditions in which there is evidence that ultraviolet irradiation is valuable; tuberculous peritonitis and enteritis, calcium deficiency diseases, secondary anæmia, carbon monoxide poisoning, pulmonary tuberculosis (as an adjunct), tuberculosis of bones and joints, atrophic and hypertrophic arthritis (as an adjunct), tuberculosis of the genito-urinary tract, ulcus serpens, corneal ulcer, tuberculous lesions of the eye, ear or nose, nasal ulcerations, tuberculous laryngitis, rickets and tetany and spasmophilia.

Antiemetic Properties of Magnesium Sulphate

Reptto and Camponovo (*Rev. Assoc. Med. argent., Ref. Gen. Practitioner*, 1940:11:165) report successful results in the treatment of vomitting by the intramuscular injection of 5 to 10 c.c. of a 25 per cent solution of magnesium sulphate, repeated if necessary, the daily dose not exceeding 20 c.c. From experiment on animals and human beings the authors found that magnesium sulphate injection prevented vomiting caused by apomorphine injection and by ipecac. The treatment

is indicated in all cases of spontaneous vomiting and that complicating various diseases, specially in presence of pain, insomnia and neuromuscular excitability. Magnesium sulphate acts by diminishing the excitability of the bulbar centres of vomiting. The authors did not find any depressive effect on the respiratory system by its use and recommends the use of calcium if such depression ever occurs.

Oxygen In High Concentration For Relief Of Cardiac Pains

Boland (*J. A. M. A.*, 1940:114:) writes that relief of pain in cases of coronary thrombosis by the administration of 100 per cent oxygen is almost dramatic as it is obtained within ten minutes after the institution of the therapy and the apprehension, restlessness and dyspnœa and the symptoms of mild shock are quickly controlled. The author advocates this therapy when the pain is intense and is resistant to opiates. No case of pulmonary irritation has been noted after this treatment.

SURGERY

Principles of Management Of Infection Of The Hand

Mason (*Rocky Mountain M. J.*, 1940:37:814) writes that the general principles of management of infections of the hand are: (1) to further the local defensive powers, (2) to increase the general resistance, (3) to provide drainage where localization has occurred, (4) to promote the healing of the resultant defect and (5) to maintain and restore function. Local defensive power is increased by active hyperæmia produced by the use of moist warm packs which are kept warm by some external source of heat, by putting the hand at rest in a position of function on a suitable splint, by avoiding any unnecessary trauma and observing strict asepsis in dressings, by the use of specific sera and sulphanilamide group of drugs. The general resistance is to be increased by bed rest, administering of sufficient fluid and of diet containing nourishing foods and adequate vitamins and blood transfusion specially in long continued and persistent infections. It is only when the process of inflammation is localized that the drainage is indicated. Localised infection must not be temporized because of the anatomical peculiarities of the tissues of the hand but in an acute spreading infection one must wait until localization has occurred and the lymphangitis and other evidence of extension of the process have disappeared. Several guiding principles are helpful in making incisions and securing drainage. Incisions on the hand should provide adequate drainage; they in themselves should lead to no disability and they should not open up spaces uninvolved by infection; they should be made to follow as far as possible the natural skin creases; they should avoid the midline of fingers and wrist and should be so placed as to leave no scar on important tactile surfaces. Drains should be of soft material such as thin soft rubber or vaseline soaked gauze which does not lead to pressure necrosis and they should be removed as early as possible. Healing of the resulting defect results only when the after-care is placed in an experienced hand. Though the hand is put at rest in the acute stage, as soon as the active stage passes off, passive movement of the uninvolved joints should be instituted and this will maintain and restore the functions of the hand otherwise the patient will end it up with a stiff hand that will require weeks or months of physical therapy.

Treatment of War Wounds In France

Jeffrey (*Edinburgh M. J.*, 1940:42:727) writes that war wounds with B. E. F. in France were treated in the early cases by (*a*) debridement and primary suture, (*b*) prophylactic sulphanilamide therapy thereafter and (*c*) rest for the wounded part and for the patient; in late cases by incision or leaving alone. Gas gangrene was treated by wide excision or amputation, sulphanilamide and anti-gas gangrene serum. The author further points out that sulphanilamide powder applied locally into the wound appeared to combat infection and plaster of Paris splintage of wounds was of value, particularly in preventing too frequent changing of the dressings. The anæsthetic of choice, in operations on extensive wounds, was nitrous oxide and oxygen, sometimes with ether in addition. Blood transfusion was life saving in many instances of surgical shock. Where the hæmorrhage was of an oozing nature and prolonged, fresh blood proved of greater value than stored blood which when used within fifteen days after storage did not produce any deleterious effect. To prevent tetanus two injections of 1 c.c. of tetanus toxoid were given with an interval of six weeks between injections. Four cases of tetanus developed in a series of 2000 wounded and the history reveals that all of them had but one injection instead of two. Two cases with shorter incubation period died and the other two with longer incubation period survived and the treatment adopted was in the following lines, *viz.*, (*a*) keeping the patient quiet with avertin or rectal paraldehyde, (*b*) maintaining the patient's strength by glucose given through an indwelling nasal catheter or by saline and intravenous glucose and (*c*) anti-tetanic serum, 60,000 units intravenously daily until the spasms began to abate which usually was in 7-10 days.

Treatment of Burns

Wakely (*Lancet*, 1940:2:621) in opening a discussion on the subject at a meeting of the Royal Society of Medicine points out that tannic acid did not prove useful as was hoped to be in the treatment of burns in the present war and opines that it should not be used in burns of the hand and face. For first and second degree burns tannic acid is excellent but for third degree burns it usually fails. Sepsis occurs deep to the coagulum and months may elapse before it separates, leaving a heavily infected granulating surface. When used on hands it leads to increase in œdema, compression of circulation and necrosis of the fingers and when healing finally occurs the mutilated fingers are dragged backwards by scar tissue and a useless claw replaces what should have been a functioning hand. The results of coagulation treatment on the face may be even more distressing—the eyelids fixed by horny tan cannot be moved for a matter of days or weeks. For the treatment of sepsis saline baths are proving valuable. Skin grafting is essential for third degree burns. After the healing of a first

or second degree burns it is important to massage the new skin with lanoline daily for six weeks to prevent the development of keloid. Shock should be treated by plasma transfusion and morphia. Whole blood transfusion is contraindicated because it increases cell concentration and so are saline and glucose infusions because they quickly pass into the tissues and increase the œdema.

Radiation Therapy In Diphtheria Carriers

Kaplan (*Radiology,* 1940:35:425) from experience on treating very successfully 11 cases of diphtheria carriers with high voltage x-ray therapy reports that the x-ray method should be used only when other forms of treatment have failed to render diphtheria carriers negative. If the throat is the site of infection the rays are directed through the tonsillar area and both sides of the neck are treated the same day, the interval between treatment is one week. If the infection is in the nasopharynx the rays are directed through the nose and face area. In most of the cases three treatments were necessary, some required 4 or 5 treatments; in 4 cases only one treatment was given. Two patients complained of pain in the jaw and neck after treatment but this disappeared within 24 hours. The treatment was immediately effective in 10 cases and in one case the culture became negative after some time. X-ray therapy is a harmless effective method of treatment for persistent diphtheria carriers and may be employed in all cases, regardless of age or sex.

OBSTETRICS AND GYNAECOLOGY

The Relation Between the Origin Of Eclampsia And Allergy

Yamada (*Jap. J. Obst. & Gynec.,* 1940:23:1) in the part I of his experiments makes a study of biological reaction of eclamptic blood serum and eclamptic placenta by *Schlutz-Dale* method and observes that antigen which induces strong shock reaction is contained only in eclamptic blood serum and eclamptic placenta and that this intense shock reaction occurs only when eclamptic blood serum or eclamptic placenta is used as a sensitizer, healthy normal placenta or healthy normal blood serum producing no effect. Thus eclampsia is induced as a result of antigen and antikörpor reaction, namely as a result of allergic reaction. In the parts II and III he makes the patholo-histological studies of different organs when pregnant rabbits are sensitized by the eclamptic blood serum and eclamptic placenta and observes that these animals show intense changes strikingly similar to patholo-histological changes of eclampsia. In the parts IV—V he makes similar studies when pregnant rabbits are sensitized by healthy pregnant blood serum and healthy placenta and observes similar histological changes but these differ only in degree and not in nature. This anomaly, the author explains, by the fact that the healthy pregnant woman is in a state of hormonic physical balance of antigen and antikörpor and whenever this balance is disturbed by any factor a disease like eclampsia results. In parts VI and VII he studies patholo-histological changes when pregnant and non-pregnant rabbits are sensitized by healthy non-pregnant blood serum and the results obtained are similar to those in previous experiment but when compared with those obtained in parts II and III go to show that there are differences in nature as well as in degree and these differences are due to the kind of blood serum used as a sensitizer, *viz.,* that of the pregnant or otherwise; in other words they are due to difference in strength of production of allergic state. Judging from these experimental results thus obtained the author does not hesitate to conclude that the origin of eclampsia is due to allergic changes.

Menorrhagia

Whitehouse (*Practitioner,* 1940:145:149) writes that a proper diagnosis of a case of menorrhagia is essential in establishing a reasonable basis for successful treatment and this diagnosis depends on (1) a careful clinical history, noting particularly the age, parity, normal menstrual rhythm, the type of abnormal bleeding, the relation of a abnormal hæmorrhage to the last normal menstrual period and to a pregnancy or abortion; (2) a careful bimanual examination of the uterus and the appendages differentiating between the organic and the functional case and (3) a biopsy of the endometrium if no organic cause for menorrhagia is recognised. If an organic cause is present the treatment should be according to the accepted tenets. If not the case falls under the category of functional disorder and treatment should be based on the results of endometrial biopsy.

If the bleeding is not checked by such simple measures as the administration of hot vaginal douche at a temperature of 116°-118°F and the administration of hydrastin hydrocloride or the cotarnine salts, *e.g.,* 'styptol' and 'stypticin' a trial may be made of the luteal or male testicular hormone. A useful prescription of treating functional uterine hæmorrhage is given below:

Re/

Styptol ..	.. 1 grain
Potass. bromide	.. 10 grains
Tinct. cannabis ind.	.. 5 minims
Tinct. belladonna	.. 5 minims
Syrup auranti	.. 30 minims

Aqua chloroformins add 1 ounce.

Sig one ounce thrice daily.

Liquor Sedans in one teaspoonful doses given three times daily is also quite effective.

When menorrhagia is found to be the result of unrestricted activity of too much or too concentrated œstradiol the rational therapy will be the administration of its antidote, *viz.,* either the luteal hormone, progesterone or the testicular hormone, androgen. Autonomic metrostaxis is not amenable to treatment by hormones but controllable by belladonna, acetylcholine, bromides, ergotamine and the cotarnine salts. On the other hand menorrhagia of puberty, menorrhagia associated with the presence of follicular cysts in the ovaries, metropathia hæmorrhagica and bleeding in conjunction with clinical evidence of œstriosis, *e.g.,* cervical erosion and leucorrhœa can all be treated

by progesterone with every prospect of success. Progesterone therepy given daily for four days before menstruation may be reinforced by the addition of a gonadotrophic hormone during the subsequent sex cycles.

Effect Of Vitamin K Administered To Patients In Labour

Fitzerald and Webster (*Am. J. Obst. & Gynec.*, 1940:40: 403) in a preliminary report on the study on the effect of vitamin K administration to a series of patients in labour observe that the patients treated with oral 'klotogen' during labours show a definite rise in the maternal prothrombin level at the end of the labour and also a definite rise in the average level of the chord blood. Patients treated with intravenous synthetic vitamin K show also the same elevation of prothrombin level and control cases do not reveal any change during and after labour.

Retrodisplacements Of The Uterus In Relation To Pregnancy

Aldridge (*Am. J. Obst. & Gynec.*, 1940:40:361) in summarising some of the facts regarding retroversion and the relationship of retroversion and its associated condition to pregnancy observes that these conditions are not infrequently the cause of sterility, early abortion and unpleasant symptoms following abortion and delivery, that postabortal and postpartum retroversion should be treated by palliative means to reduce the incidence of permanent retrodisplacements of the uterus unless it is known that retroversion preceded pregnancy, that associated functional and pathologic conditions of the uterine adnexa more frequently constitute indications for operation for cure of retroversion of the uterus, that the aim of the operation for cure of retrodisplacement should be to restore the function of the broad as well as the round ligaments and the incidence of failure in operation will be reduced if conception can be postponed until atleast six months after operation.

PEDIATRICS

Recent Advances in Treatment in Diseases of Children

Moncrieff (*Practitioner*, 1940: 145: 244) deals with the subject under the following heads.

Problems of the new-born—*Intercranial hæmorrhage:* It is clear that after birth there is a fall in the amount of prothrombin in the blood which later on rises. Hæmorrhages are likely to occur during this period of low prothormbinæmia but the administration of vitamin K or its chemical analogue can raise the low prothrombin to normal levels. It has been further observed that the use of Vitamin K natural and synthetic, in mothers not less than four hours and not more than twelve hours before delivery of their infants can prevent the neonatal fall and as such this treatment can be rationally employed for the prevention of "hæmorrhagic disease of the new-born". Intramuscular injection of adult blood (5 c.c. to each buttock) still remains the treatment of choice in hæmorrhagic disease but this treatment may be reinforced by the use of vitamin K or its chemical analogue (10 to 15 mgms. given intramuscularly). Moreover in cases of intracranial hæmorrhage extension of the damage may occur during the period of low prothrombin by secondary oozing through a soft clot and this may be prevented by prophylactic administration of vitamin K to the mother in all cases of difficult labour. *Asphyxia neonatorum.* Recent physiological researches done on the subject point to the necessity of adoption of the following measures for resuscitation of the newborn; early clearing of the amniotic fluid and debris from the upper respiratory passages, prompt clamping of the chord to stimulate the respiratory centre by cutting off the oxygen supply and the maintenance of a head-low position for some hours after delivery, so that fluid in the lungs may drain into the pharynx, from whence it may be evacuated. *Infection.* The sulphanilamide drugs offer a new weapon against certain special varieties of infection in the new-born. For gonococcal ophthalmia sulphapyridine given in doses of quarter tablet four times a day (crushed with sodium bicarbonate and mixed in a little milk) for a total dose of six tablets combined with irrigation of the eye with normal saline every four hours gives excellent results. *Pemphigus neonatorum* also responds well to oral use of sulphanilamide and local treatment. with application of a 4 per cent silver nitrate solution after snipping of the blister. *Breast feeding.* McNeil stresses on the importance of breast feeding in reducing infant mortality. Failure of lactation is tackled successfully by using as early as possible after child-birth, two preparations of the lactogenic factors of the anterior pituitary (prolactin and pysolactin) in the following way: first and second day 5 c.c. intramuscularly; third and fourth day 2 c.c. and fifth day 1 c.c. *Vitamins in pediatrics.* Vitamin A and D may be conveniently taken together as when sufficient vitamin D is being given there will be a safe intake of vitamin A. The value of vitamin B in the treatment of 'pink disease' and in various forms of neuritis has been doubted by many workers. However, a vitamin B supplement may well be considered for infants whose progress is unsatisfactory. Vitamin E (½ oz. twice a day of fresh dried whole-wheat germ) has been found to be remarkably effective in cases of certain muscular dystrophies. *Sulphanilamides in childhood.* In sulphanilamide therapy the aim should be to secure an adequate concentration in the blood—between 4 and 10 mgm. per 100 c.c. and this has been achieved on following scheme of dosage (Hynes) :—

Age.	*Dose in Tablets (1 tab. 0·5 gm.)*	*Dose in 24 hours. gm.*
0-3 months	¼, 4-hourly	0·75
3-6 „	½, 6 „	1·0
6-8 „	½, 4 „	1·5
1½-4 years	1, 6 „	2·0
4 to 8 „	1, 4 „	3·0
8 to 12 „	2, 6 „	4·0

The initial dose should be double the subsequent dosage.

EVOLUTION OF GLAND-THERAPY

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Credit commonly goes to Claude Bernard for the discovery of hormones though, it was Brown-Sequard who first revealed the facts of some of the internal secretions and directed our attention to the therapeutic value of the secretions in the disorders of the organs of sex. On a memorable evening of June, 1889, he announced the remarkable rejuvenating effects produced in himself by the subcutaneous injections of testicular extracts.

Schreiner in 1878 first discovered 'Spermin' and many investigators in various countries have found that testicular extracts, more specially 'Spermin' believed to be found in the thyroid, ovaries and various other glands, other than the testes, was essential for the tissue-growth and sex-differentiation: while Pœhl regarded it as a positive catalyser or accelerator of metabolic processes, exerting a real influence in giving tone to the heart and other muscles.

The notable discovery by Brown-Sequard, a quarter of a century ago that the ingestion of testicular juices in states of debility and senility acted as a tonic and rendered beneficial effects, opened a brighter way to a new field of therapeutics. But it was not until 1869 that the same discoverer first suggested that an important secretion was elaborated by the ductless glands which is eventually received into the circulation.

Howard Kelly in the *British Medical Journal* of January, 1898 remarks—"The Spermin-secreting and elaborating organs may be called the apothecaries of the body, secreting many medicaments, much more active and more accurately representing its true wants than artificially administering drugs."

Havelock Ellis while discussing the mechanism of detumescence mentions that as the ovaries are strictly analogous to the testes, it was surmised that ovarian extract might prove a drug equally valuable with the testicular products. As a matter of fact ovarian extract in the form of 'Ovarin' seems to prove beneficial in various disorders, more specially in anæmia, chlorosis, and in troubles due to artificial menopause.

It is of interest to point out that the internal secretions of the ovaries and its important functions seem to have been suggested before any other glandular secretions. Yet older beliefs about the semen in days of witch-craft and the swallowing of semen to add to the powers and strength of mankind can still be found in older texts. The early history of this subject is more or less inextricably commingled with the folklore practices of magical origin.

The consuming of semen among the aborigines later developed into a mode of consuming testes as a whole for the same belief as a natural stimulant and aphrodisiac and even a charm to cure impotence. References are found in the history of ancient Rome or practices, among the ancient Irish peasantry. This belief, perhaps, founded in experience was not only held by the highest medical authorities in Greece but also in India and Persia. The Aurvedic and Unani systems of medicine even made use of them long before the scientific researches brought facts into the light of to-day.

Early in the 19th century Cabanis argued that the ovaries are the secreting glands, following a particular humor, which is re-absorbed in the blood and imparts excitations which are felt by the whole system and all its organs.

But our present day knowledge reveals the fact that the female generative apparatus is more or less closely linked with a number of endocrine glands, particularly the thyroid, the ovaries, the pituitary and the adrenals, etc.

Closely linked and complex, and really complex as the relationship between these endocrines with the systemic variations are, the relationship between the endocrines themselves are also diversely complex. We cannot discuss in so short a compass all that we have uptil now known of them, but barely mention the fact that there is a close connection between the thyroid function and that of the gonads. As evidences prove the relationship between the thyroid and gonads, abundant evidences so prove the intimate physiological relation between the pituitary body and the generative glands. Similarly there has been a brilliant advance in our present knowledge as to the influence of anterior pituitary body upon reproduction and sex-cycle.

In 1806, Meckel reported a case of absence of suprarenals and the sex-glands in an acardiac monster. The changed and exaggerated function of the suprarenals during pregnancy and the changes in the sex-apparatus with suprarenal hypertrophy or a retarded sex-development with the hypoplasia of the suprarenals—establish a positive relationship between the functions of suprarenals with the gonads.

The pineal body, the thymus, the mammary glands are all closely related with the sex-knowledge and sex-apparatus. Even the pancreas is no exception. Rebaudi, working in Bossis' clinic at Genoa, reported that he was able to demonstrate a functional connection between the ovary and the pancreas. He holds that when the function of the corpus luteum in the ovary is diminished, the islands of Langerhans show a marked hypertrophy, compensatory he calls it, the islets evidently doing extra amount of work.

The unravelling of the hormonic mysteries has laid bare a host of others still more obscure, "till one cannot but be astounded at the complexity of these beautiful mechanisms, the existence of which has been undreamt of till recently". Even the appearance and maintenance of sexual characteristics is dependent upon the whole chain of ductless glands: and Blair Bell may be aptly quoted as *"Propter secretiones internas totas, mulier est quod est"*.

To-day the pioneers are Allan and Doisy in this study of hormones. For our knowledge of α hormones or β hormones (œstrins, folliculin, thelykinin etc.) to-day, we owe to them and many others, *viz.,* Kelly of Georgia, Nicholson, Lange, Kendell, Davis and Koff, Corner and Neustædtr.

The extracts prepared from all the organs have been clinically employed in the treatment of disorders of menstruation and as a matter of fact these extracts are like the drugs which we use in combating disease, the organ-extracts being definite chemical substances.

To talk of the ovaries alone, the known facts as to the functions of the ovary is sufficient to supply a rational basis for ovarian therapy. In the widest sense of the term practically all the organs of the body produce chemical substances.

Physiologically the normal development of the genital tract depend upon the undisturbed internal secretion of the ovary and the same is true of the functions of the genital tract. Puberty, menstruation, pregnancy and climacterium are all dependent on the thyroid and ovaries.

The hypo-function, hyper-function or a dysfunction of these glands may cause troubles: to enumerate a few of them, —instead of running into text book discussion we may group some of them:—

(1) Disturbances of psychic state of a woman. (2) Disorders of functions: (*a*) Primary or secondary amenorrhœa, or simple, symptomatic or psychic. (*b*) Menstrual irregularities. (*c*) Menopausal irregularities. (3) Disorders during a normal pregnancy. (*a*) Threatened abortion. (*b*) Missed abortion. (*c*) Molar pregnancies. (4) Disturbances in growth, and of development of sexual characters, in both sexes. (5) Impotence in both sexes. (6) Sterility in both sexes. (7) Cryptorchism. (8) Hypertrophy of the prostate—and various others.

Attempts at treatment of gland deficiencies are being made by administering additional gland extracts and an attempt at ovarian therapy was first made in 1896 at Landau clinic in Berlin:—the preparation was made from the fresh ovarian substance obtained from cow or sow. Frænkel, the father of corpus luteum theory of menstruation is also responsible for the use of corpus luteum extracts and this form of therapy was popularised by Burnam in 1904. Graves in 1909 suggested extracts from the portion of the ovary from which corpus luteum was removed.

Fresh gland extracts or gland as a whole are still administered by veteran medicos even to-day, in the shape of fresh liver for anæmia and fresh testicular substance of goats for impotency until some manufacturers merged into the market with all their biological extracts and compounds. Even kidneys and stomach were not spared as also the lung substance !

But what values the biological products could be put to are well-known to many who dealt with them and while believing in the organotherapy we lost faith in many of the biological products.

The commercial extracts available are the extracts of the whole ovary or the corpus luteum either in the form of capsules, tablets and powders, and also of the other glands. Watery solutions in ampoules were tried but earned very little reputation and our present day knowledge shows that the watery solutions are inert, and oral gland therapy unconvincing and there is a growing scepticism in this regard. There is, of course, reason enough to justify an effort along the lines of rational organotherapy.

Rational as ovarian therapy appears to be in some conditions, the results with extracts are rarely striking. And it cannot be assumed that a commercial extract can replace the normal secretion in the patients' body. The crux of the whole problem lies here, and the solution depends largely on the work of the biochemist. "Until this day, the physician who uses ovarian therapy should keep his feet on the ground, and not let himself be carried away by the claims of those who have something to sell, or the ill-advised and premature reports of honest but deluded professional colleagues who have not yet learned the dangers lurking in the *post hoc propter hoc* method of reasoning". There can be little doubt as to the importance of ovarian therapy but certainly there is much doubt as to the oral use of ovarian extracts.

With a view to rationalise organotherapy, Langdon Brown after an extensive study has very recently formulated the following postulates which must be satisfied before we can ascribe therapeutic potency to any of the internal secretions. These are: (*a*) That the gland in question forms an internal secretion. (*b*) That the active principle or principles can be extracted. (*c*) That a method of administration is available which will admit of its utilization by the body.

The above-mentioned postulates are satisfied to their fullest by the gonado-tropic hormones (ovarian and testicular).

Newer methods of glandular therapy after work of Allan and Doisy on the work of ovarian hormone and that of Frank on female sex-hormone lay stress on the dominating follicular hormone. As to the effect of follicular hormone with the biological preparations, though not very encouraging, are not at all disappointing.

So far known the ovarian hormones are the œstrin of the follicular hormone or the α hormone which circulate in the blood even in early life before puberty and progesterone, secreted by the corpus luteum also known as β hormone, is eventually found in circulation after puberty.

Chemical analysis after laboratory isolation of these having been possible, it has been found out that the ovarian follicles secrete œstradiol, which is clinically given in the form of benzoate and propionate esters parenterally. The luteal hormone, known as the progesterone is also a sterol which has been synthesized and is artificially prepared from stigmasterol found in soyabean. Pregnene is the parent substance.

All the sex-hormones are relatively simple derivatives of a saturated tetrocyclic hydrocarbon, which constitutes also the

nuclus of the sterols, bile-acids and toad-poisons.

For a further understanding of the chemistry of these synthetic products, the readers might refer to the literature published in January, 1939 by the Society of Chemical Industries, Basle, Switzerland, (Sex Hormones).

These synthetic products have now found a place in the wide field of therapeutics and have been found to be more potent than the biological extracts. The preparations in use show definite success in various cases of disorders and diseases. The ovarian hormones present in the market are—œstrone, œstradiol, œstradiol dipropionate, œstradiol benzoate, progesterone and anhydrohydroprogesterone having various trade names. Satisfactory results having been obtained in a group of cases, a few case notes have been added to these lines, to show what a field of research is still before us, to bring our knowledge of the science of organotherapy to yet brighter light.

In conclusion, certainly it is a fact that we have something in our hands now which may at least prove hopeful to-day in various disorders of function of the sex-organs, for the treatment of which we did in days of yore, really grope in the dark. To combat the menstrual disorders our old sheet-anchors, iron and arsenic or ergot and hydrastis have surely found shelter in the domain of definite indicative therapeutics whilst the synthetic hormones have their own role to play in the field of treatment of sex-disorders.

Abnormal disturbances or disorders may be local and general, and we have utilized the synthetic hormones in a charmingly new method of treatment. Once this broad venue to organotherapy is open to us, we can run our own course to really helpful interpretations and observations in cases where we had previously to pay a heavy toll in crossing the difficulties, and the scope of these synthetic hormones in obstetrics and gynæcology, as the deductions do really prove, are overwhelmingly wide in affections both local and general. Our hopes are great, the field enormous and to find more out of this mode of treatment, we should yet further progress towards this successful line of research.

Age, parity and leading features.	Diagnosis.	Treatment.	Result.	Remarks.
1. H. F. 17. Primipara. Carrying 12 weeks, vomiting, albuminuria.	Hyperemesis gravidarum.	*Hormone*—Progesterone (Lutocyclin Ciba) 2 mg. twice daily for 2 days. 5 mg. twice daily for 7 days. 5 mg. twice in a week for 8 weeks. *Accessory*—Glucose, alkali, saline rectal and sedatives, stomach wash.	Showd signs of improvement after 5th injection of Lutocyclin (total 9 mg.). Vomiting stopped after a week's treatment. Confined at town, delivered of a living child, labour—normal.	Conservative treatment with only glucose alkali etc. proved unsatisfactory. Therapeutic abortion was thought of, not undertaken.
2. H. F. 14. Unmarried. Absence of secondary sexual characteristics. Marked under-development of generative organs. Primary amenorrhœa. Leucorrhœa, vulvo-vaginitis.	Infantilism.	*Hormone*—Oestrin (Ovocyclin P Ciba) 5 mg. every 3rd day for 2 weeks, rest 2 weeks—given 3 such courses. *Accessory*—Local wash and antiseptics.	On the 10th week development of breasts and pubic hairs; feminine shyness, etc. were noticed. Menstruated on the 11th week. P.V. appreciable increase in the size of ut.	Followed up for 6 months. The results were persisting and the girl was gradually attaining her womanhood.
3. H. F. 28. Pentapara. Carrying 7 months. Pain lower abdomen, occasional small bleeding P. V., foul discharge, urine free, W. R. negative.	Threatened miscarriage.	*Hormone*—Progesterone (Lutocyclin Ciba) 5 mg. a day for 3 days. 5 mg. on alternate days for the next one week. *Accessory*—Rest and sedatives.	Discharge and pain subsided after 3rd injection. Full term normal labour excepting delayed delivery of placenta showing infarctions at places.	
4. H. F. 18. Primipara. Carrying 4 months, occasional slight pain, sharp exhausting bleeding on 3rd day of 16th week, persisting in diminished severity. Cervix slightly dilated.	Threatened abortion.	*Hormone*—Progesterone (Lutocyclin Ciba) 5 mg. 1st day. 10 mg. daily for 10 days. *Accessory*—Rest and sedatives.	Pain and bleeding stopped after a week.	Symptoms recurred on the 6th month, controlled by the same treatment, labour on 265th day, normal delivery, uneventful puerperium.
5. H. F. 35. Nullipara. Slight and inconsistent pain lower abdomen. Irregular and painful menstruation, flow scanty. Infantile uterus with tented vagina.	Hypoplasia of the uterus.	*Hormone*—Oestrin (Ovocyclin P Ciba) 2 mg. every 4th day from the last day of one mens. cycle to the 1st day of next cycle—7 days rest. *Accessory*—General tonics containing vitamins.	After one course menstrual flow was satisfactory; after 2 courses P.V. exam. revealed appreciable increase in the size of ut. with a definite formation of post. fornix.	Though of masculine build had secondary sexual characters, periods normal previously, 6 months follow-up with no recurrence of symptoms.

Age, parity and leading features.	Diagnosis.	Treatment.	Result.	Remarks.
6. A. I. F. 20. Unmarried. Dysmenorrhœa—tenderness both iliac fossæ during menstruation. Periods irregular lasting for more than 7 days at times, flow much increased. Leucorrhœa. P.R.—Ut. small in size, R.V. & R.F., mobile.	Dysmenorrhœa and hypoplasia of uterus.	*Hormone*—Oestrin (Ovocyclin P Ciba) 2 mg. twice in a week for 2 weeks. Progesterone (Lutocyclin Ciba) 2 mg. for 2 weeks. Rest 7 days. Treatment begun after a course of lacto-protein injection. *Accessory*—Local cleanliness, douche—Sodi Bicarb. 3i to Oi. Lacto-protein in graduated doses.	Leucorrhœa and tenderness in the iliac fossæ subsided after the course of lacto-protein. After one course of hormone therapy the menstruation was normal in all respects.	Followed up for 3 months. The patient was free from all complaints.
7. H. F. 20. Unipara. Amenorrhœa—4 years, age of last baby 4 years. Baby breast-fed. Ut. small, mobile and markedly A.F. Periods regular formerly, anæmia—slight, spleen—2 f.	Super-involution.	*Hormone*—Oestrin (Ovocyclin P Ciba) 5 mg. every 5th day for 3 weeks, commencing from the last day of the expected mens. after treating anæmia and malaria. *Accessory*—Quinine and iron—1 month. Breast-feeding was not allowed.	Pt. menstruated after one course of Ovocyclin P. Ut. increased in size and regained normal position.	Menstruation did not commence after treatment for anæmia & malaria. So organo-therapy was tried. Follow-up for 2 more cycles. Menstruation was normal.

THE FUTURE OF SCIENTIFIC MEDICINE IN INDIA

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LUCKNOW.

Before suggesting remedies for the causes at work against the scientific system, it seems necessary to discuss the charges labelled against it as they form the subject matter of the propaganda. The result of the intense propaganda is such that these charges are believed to be true, not only by the public but also by a large number of doctors. The last is especially deplorable.

The defects generally attributed to the modern system are that (*i*) it is expensive, (*ii*) it is unsuited to the temperament of Indians, (*iii*) it is a foreign system, (*iv*) it consists of surgery alone and is inferior in other respects, and (*v*) it did not allow the Indian systems to develop and flourish.

Each of the above charges can now be considered separately.

I. The claim that the scientific system is expensive as compared with the Indian systems is as false as it is commonly believed. A little consideration of hard facts will convince any honest person to the contrary. The first point that must be realised is that the treatment given to the villagers by illiterate persons passing under the name of Vaids and Hakims has been shown in a previous communication (*J.I.M.A.*, Vol. ix, p. 600), to be neither Ayurvedic nor Unani and should not be taken into account. The cost of treatment given by the properly trained Vaids and Hakims in large towns should only be considered. The best way will be to send a patient round to a dozen Vaids and Hakims and then to a dozen doctors, and to calculate the average cost of treatment prescribed. Extensive observations have proved that the scientific treatment is much cheaper. This may sound incredible but nevertheless it is a fact.

The cost of treatment should be considered firstly under private treatment and secondly under hospital treatment.

Private Treatment.—The cost of medicines prescribed by Vaids and Hakims for really rich patients can conveniently run into thousands while in the case of doctors into tens. In some cases it is known to be as high as Rs. 5,000, Rs. 10,000 or even Rs. 20,000. Such costly medicines are supplied by the Vaids and Hakims themselves and more than compensate them for their services even if they be gratis. In the case of scientific treatment the highest possible price of any conceivable tonic or patent medicine cannot be more than Rs. 5, Rs. 10, or Rs. 20.

The cost of Ayurvedic or Unani treatment in the case of middle class patients can be as much as Rs. 5 daily and at the end of a few days when the confidence of the patient has been gained, a special preparation is usually prescribed which can cost anything from Rs. 50 to Rs. 500. The cost of Allopathic medicines needs no mention.

The really poor patient cannot afford private treatment and goes to a hospital.

It remains to be noted that the cost of common remedies known to the public and used by them without consulting a physician is decidedly less in the case of Allopathic medicines than in the case of indigenous medicines, *e.g.*, Mag. Sulph., Cafiaspirin, Aspro, Castor Oil, Camphor Oil, Pulv. Glycyrrhiza Co., Carminative Mixt., Quinine, etc.

Fees: The fees charged by the topmost doctors are the same as those of Vaids and Hakims. The fees of moderately promi-

nent Vaids and Hakims range between Rs. 5 and Rs. 10 while the lowest class of physicians charge Rs. 2 per visit. The fees of doctors do not exceed this scale.

Nursing : The employment of nurses increases the cost of treatment. Nurses become indispensable in some cases especially in acute cases. The employment of nurses depends on the nature of the disease and has nothing to do with the system of treatment. It is the hard lot of doctors that they and they alone and not the Vaids and Hakims have to undertake the treatment of acute and serious cases.

Other Factors : There are three factors which raise the cost of treatment and due consideration is not generally given to these important factors in calculating the cost of treatment.

(*a*) *The treatment of surgical cases* is more expensive than that of medical cases *e.g.,* cases of carbuncles, cellulitis, erysepelas, gangrene, sloughing ulcers, casualty cases etc. On the other hand ordinary medical cases will cost much less, *e.g.,* constipation, indigestion, diarrhœa, cold etc. The Scientific Medicine alone can and does tackle surgical cases and in return gets the reputation of being expensive.

(*b*) *Acute and serious cases.* It is again the hard lot of the doctors that they are entrusted with the treatment of acute and serious cases which never go to Vaids and Hakims. The cost of treatment in such cases is bound to be more than that of chronic or mild cases. The chronic cases alone generally have the choice between Vaids and Hakims on the one hand and doctors on the other.

(*c*) *Cases of sexual weakness.* Cases of sexual weakness and of those seeking remedies to enhance their sexual powers are very common. There is a common weakness among many Indians to use remedies that will improve their otherwise normal sexual powers. All these cases go to Vaids and Hakims as doctors are believed to have no suitable remedies. These cases constitute some 80 per cent of all the cases that go to Vaids and Hakims. The cost of treatment of these cases conveniently runs into four figures and certainly into three figures for those who cannot afford the former. Unfortunately for the scientific system this treatment is done in secret and the expenses incurred do not come to public knowledge and are kept secret even from relations. These cases are overlooked when the relative cost of treatment under the two systems is considered.

Before passing on to the consideration of hospital treatment it will be interesting to consider the actual cost of allopathic drugs and medicines as compared to those of indigenous drugs and medicines. The actual cost of allopathic medicines will be less than the actual cost of Ayurvedic or Unani medicines. For example, a dose of a mixture containing a few grains and a few minims of drugs costing As. 4 to Re. 1 or Re. 1-8 per pound cannot cost actually more than a few pies whereas any decoction or infusion of Vaids and Hakims cannot cost less than a few annas. The cost of any patent medicine cannot exceed Rs. 10 or Rs. 15 whereas some Ayurvedic and Unani preparations containing precious stones, gold etc. cost as much as Rs. 100 or Rs. 150 per tola. An expensive chemist's shop in a central place of a large town providing comfort and convenience to customers, observing cleanliness and accuracy in compounding and dispensing does and shall raise the cost of medicines. If the Ayurvedic and Unani medicines were as carefully and cleanly dispensed as they ought to be, their cost too will be raised. It is the good fortune of the Indian systems that the cost of time and labour spent by the patients or their relatives in preparing medicines in their own homes is conveniently forgotten.

Hospital Treatment. The cost of building, equipment, provision of modern comfort, convenience to the patients, and the recurring expenditure on the establishment of a good hospital will be the same for the scientific and the Indian systems. The actual cost of medicines and their preparations will be less in the case of the former than in the case of the latter. This fact is borne out by calculating the cost of medicine per patient in an allopathic hospital and comparing it with that of an Ayurvdic or Unani hospital.

If actual facts and the three factors discussed above are taken into consideration no fair-minded person will believe that the scientific medicine is more expensive than the indigenous medicine.

II. It is said that the scientific system is suitable for a cold country like Europe and is injurious for those living in a hot country like India. It is as absurd as the first charge. It is based on the theory that every thing is either hot or cold and on the supposition that every drug in the allopathic pharmacopœia is hot. This time-honoured theory, unfortunately, is no longer so firmly believed by its followers and the conception of hot or cold action of drugs was based on this unverifiable and no longer tenable theory. No facts and figures can be furnished to prove that the European system is harmful. In the domain of surgery, midwifery, gynæcology, ophthalmology, and dentistry this charge of unsuitability is waived off as the rival systems are practically devoid of any respectable knowledge on these subjects. Suitable or unsuitable, the aid of the scientific system only is and can be invoked in such cases. So far as medicine is concerned the brilliant results and successes can only refute the charge.

The success of this false and absurd propaganda is due to the conviction in absurd theories and notions instilled by these systems during centuries of unrivalled supremacy. Things are hot or cold, dry or moist, drinking of water in fever causes enlargement of spleen, application of cold in fever causes pneumonia etc. are common beliefs which nothing but organised propaganda with the object of educating the ignorant public can shake. The inability of the Allopathic system to remove these deep-rooted convictions leads the people to believe anything against it.

III. Knowledge is the property of one who acquires it. It is and it ought to be universal. Medical science has become as much Indian as European. Indians learn it, practise and contribute to it. It has become neutralised and naturalised. If it is useful it should be indianised and retained in spite of its foreign origin. So many foreign discoveries, inventions, and devices have been adopted because they are useful. Why not the Medical Science?

VI. The Indian systems have no surgery worth the name and their followers are constrained to admit the superiority of the foreign system in this respect. They consist of medicine alone, and they hope to gain something by denouncing the medicine of the Allopathic system. Facts and statistics speak otherwise and can convince the educated mind to the contrary. But cleverly the propaganda is confined to the unthinking public. The Scientific system has to realise that its existence and future depend on the uneducated and unthinking public.

V. The fifth charge that the modern system did not allow the Indian systems to develop and flourish is also wrong. The Indian systems draw their inspiration from ancients who are believed to have been inspired and almost divine. However great these ancients might have been they are no more with Vaids and Hakims to teach them more. However absurd their views might have been, to Vaids and Hakims it is a sacrilege to differ from them. They are regarded as too great to have left anything to be added or improved. Like of them cannot be born. This sort of mentality alone is responsible for the lack of development. Then why accuse the Scientific System? During centuries of patronage under Indian rulers both Hindus and Mohammedans they did not make the least improvement. It is because these systems are incapable of improvement on account of their intrinsic defects. They do not flourish because they are too crude and incomplete to meet the demands of the present-day world. Then why lay the blame on the Scientific System the only fault of which consists in being based on facts which everyone can see and on experiments and observations which anyone can repeat and not on supposed and imaginary theories which cannot be verified. Why such absurd propaganda succeeds has been discussed in a previous communication published in the October, 1940 issue of the Journal of the Indian Medical Association. That it is doing incalculable harm to the cause of the Scientific Medicine in India cannot be denied. It is for the profession to devise means to counteract it. A few suggestions are now placed before the profession for consideration.

The Remedy

The five factors already discussed require to be remedied as they are intimately connected with the future of the Scientific Medicine in India.

The ignorance of the masses and propaganda of the Vaids and Hakims—We must organise a propaganda with the object of educating the public. In justice to the masses it can be stated that they are not to blame when they are kept in ignorance about the so-called 'Foreign System' and their minds are being poisoned against it. The question arises as to whose duty it is to enlighten them. Certainly it is to a great extent the duty of the Medical Profession and, if it honestly believes in the superiority of the system, it will be humanitarian work to save the suffering humanity from the ravages of the systems it believes to be obsolete and crude. From this honest and unselfish propaganda will accrue some advantage to the profession also which, however, must be a secondary consideration. Unless organised and individual efforts are made to enlighten the public the future will remain in jeopardy.

Our outlook and medical ethics must change with the times if this system is to exist in India. Adaptability is the secret of existence. Unless we adapt ourselves we are doomed. The profession must realise that the existence of this system does not depend on the members holding a few coveted posts but on those who are labouring at the bottom of the profession. Then the profession is divided into water-tight compartments. The gaps must be bridged over, and the profession as a whole must be organised. The compounders and the chemists depend for their existence on the existence of the Profession. They must be told to organise themselves and take part in the education of the public. There must be perfect understanding and co-ordination between the various classes of members and appendages of the profession. On organisation, co-operation and propaganda depend the future of the system.

Co-operation between political bodies and the Indian systems—With organisation comes power and strength and it will not be possible for various political bodies to ignore us. We should tell publicly what we believe about our system and other systems. There is a tendency in some quarters even among medical men to show reverence for the old Indian systems based on ignorance or dictated by political or personal considerations. Some even meekly plead guilty to the charge that the scientific system is more expensive which is again due to ignorance of actual facts and figures. Investigation must be made about the actual facts and statistics must be collected. They should be made known to the world. In the face of these facts and figures it will not be easy for public men to condemn the system and applaud other systems

Political changes in the country—We have so long depended on the patronage of the Government and on the guidance of the doctors whom Government employ. The outlook of the doctors in the service of the Government was not such as to lead to the development of a free medical profession as their promotion did not depend on the favourable opinion of the masses about the system they practised as is the case with the private practitioners. Secure under the patronage of the Government, the Modern Medical Science so far did nothing to ingratiate itself with the people. When rapid changes are occurring in the political conditions of the country it has to be realised that the future of Modern Medicine depends not on Government patronage but on the patronage and appreciation of the masses. Our outlook, therefore, must also change. With the change that is coming over the country we must safeguard against the possibility of a change in the system receiving patronage.

Un-Indian ways of the doctors—We learnt aloofness from our predecessors and those members of the profession who were in Government service. It may have been very well for them but now it is proving detrimental to the cause of the profession and the system. Our behaviour must attract and not repel people. We must change our angle of vision, our ways, and must realise that we are Indians and have to live and work among them. We must devise means to enthrone ourselves in the hearts of the people, must learn a language intelligible to the people, and must teach them to appreciate our science. If

we become popular with the masses, let come what change may, our future will be secure.

Education in the Ayurvedic and Unani institutions—As has been shown in the first part of the article these institutions are producing what has been aptly called by a keen observer as 'Eastern-Western Hybrids'. These so-called 'hybrids' are proving and will prove the greatest danger for both the system they claim to practise and the Medical Science. They are likely to degenerate both the Medical Science and the profession. This degeneration will in the long run affect adversely the health of the country as a whole. It must, therefore, receive the anxious consideration of the leaders of medical thought in India. The old systems are being rejuvenated and regenerated by imbibing the Modern Medical Science. Why then should their followers be allowed to call themselves practitioners of the old systems when they mainly learn and practise the modern Medical Science? To meet this danger which to my mind is the greatest of all the difficulties the profession has to face, the only course left is to initiate the members of the medical profession into the old systems. From the suggestions outlined below it will appear that it is the most practical way.

In all medical colleges a chair of Indian Medicine should be created and Ayurvedic and Tib should be made a compulsory subject in the course of study extending over two terms of three months each. The medium of instruction should be English. It may perhaps appear to those unacquainted with these systems that the period of instruction suggested is too short. As a matter of fact it is quite ample when we realise that the sum total of knowledge in these systems does not bear any relation to the total knowledge in any one subject of modern medical science. The idea is to teach only an outline of the history and the principles of these systems avoiding unnecessary details and it will be easy for the developed minds of the medical students, to grasp them easily within the period specified. When Anatomy, Physiology, Toxicology, Jurisprudence, Hygiene, Surgery, Ophthalmology, Gynæcology, and Obstetrics which do not exist as separate subjects in the old systems are excluded, principles of medicine can be picked up by any doctor within three months. The pharmacopœia is very vast but the number of drugs which generally a Hakim or Vaid remembers and prescribes do not exceed 100 or 150. Only 100 to 150 drugs are taught in institutions teaching indigenous systems. It is therefore easy to read about the actions of some 200 drugs and remember the most commonly used ones which cannot be more than 50 or 60 within one month.

An alternative suggestion is that after passing the final examinations a six months' course in Ayurvedic and Tib may be made a condition precedent to registration and practice.

If the medical colleges refuse to initiate the coming generations of doctor into the Indian systems of medicine the doctors in big cities can organise a sort of a school where one hour's study daily say at night will enable a busy doctor to get a diploma within a year. It will not be expensive to run such a school. A local Hakim and a local Vaid can be engaged and a fee of Rs. 5 per month will more than suffice for all expenses.

This acquaintance with the old systems of medicine will enable the doctors to appreciate the superiority of the Scientific Medicine all the more, enhance their respect and value in the eyes of the public and enable them to counteract the propaganda against them.

In medical colleges the students must be taught the vernacular names of the drugs they learn in materia medica as far as equivalent names can be found. Further they must be taught the names and actions of the commonest household remedies and bazar medicines which cannot be more than 2 or 3 dozen. This knowledge will prove of immense benefit to them in later life. Lack of acquaintance with these few remedies lowers their value in the public eye.

All medical colleges and big hospitals must undertake to investigate the action of at least half a dozen drugs of the Indian Pharmacopœia per year.

The medical periodicals must reserve some space for articles on the principle and practice of the Indian systems of medicine and their history. Special stress must be laid on the comparative study of the modern and old systems, on facts and figures, and on the results of treatment under the two systems. As has been pointed out in the first part the younger generations of Vaids and Hakims are taught a good deal about the modern medical science as if it was a part of the old systems and this knowledge ensures their success and the future of the old systems. If the medical profession were acquainted with old systems it could utilise this crude knowledge for scientific investigation which would be in the interest of humanity.

Thus attacked, it is easy to conceive that, within 10 years the propaganda against the scientific medicine will explode. making its future in India brighter. It will increase the respect and value of the doctors, and the scientific system will no longer be dubbed as foreign, expensive, and unsuited to the hot country of India.

ASSOCIATION NOTES

Minutes or proceedings of Branches and Affiliated Societies intended for publication should be sent to the General Secretary of the I. M. A., Samavaya Mansions, Calcutta—EDITOR.

ANDHRA PROVINCIAL BRANCH

Extracts from minutes of the 2nd meeting held at Vizagapatam on 28th December, 1940 at 9 A.M. with Lt.-Col. T. S. Shastry, I.M.S. in the chair:

The following resolutions were passed—

Resolved that the funds of the Andhra Provincial Branch of the Indian Medical Association be deposited in the Krishna Co-operative Central Bank, Ltd., of Masulipatam, and that the Hony. Secretary and Treasurer Dr. S. Hanumontharao, L.M.S., and Hony. Joint Secretary Dr. M. Seshacharyulu, L.M.S., of Masulipatam, be authorised to operate the account;

Regarding the South Indian Provincial Branch of the Indian Medical Association formed recently at Madras, the Provincial Council of the Andhra Provincial Branch of Indian Medical Association is of opinion that the proposal to start a "South Indian Provincial Branch" is against the spirit and letter of the rules of the Indian Medical Association [*vide* rule 6C(*d*)] and will lead to complications, as an Andhra Provincial Branch of Indian Medical Association has already been formed and is functioning and the term 'South India' includes Andhra besides other linguistic areas in the Madras Presidency and is misleading. This Council requests the Central Council of the Indian Medical Association to advise that some other suitable name be chosen for the proposed branch.

The question of a Journal is postponed and the Secretary is authorised to correspond with the authorities of Andhra Medical Journal and Andhra Medical Association.

The Medical employees of Local Boards and independent practitioners when drafted into Military Service should get the same emoluments as the Government doctors of their standing and qualifications. (This resolution is to be forwarded to the proper authorities.)

The appreciation of the services of Dr. V. Govindan Nair, L.M.S., F.R.C.S., etc. Vizagapatam, for the formation of this Provincial Branch be recorded.

BAGERHAT BRANCH.

Extracts from proceedings of two ordinary meetings held on the 14th and 18th January, 1941 respectively with Dr. Jatindranath Banerjee, M.B., in the chair:

Dr. Pulin Behary Roy, M.B., was elected Honorary Secretary for the third term in succession.

Dr. A. C. Nag, M.B., described a case of malignant malaria diagnosed clinically and by the therapeutic test of atebrin mussonate. The case report is as follows: H.M. 40; history of residence in places endemic to malaria; fell suddenly ill on 8th January, 1941 with the complaint of intense headache and nausea, the axillary temperature was not above the normal but the temperature under the tongue was 100°F, on the second day the patient gradually passed into a semicomatose condition and on the third day passed blood in the urine. Physical findings on the 3rd day: markedly icteroid, no spleen but the liver was enlarged and tender.

Treatment followed was atebrin mussonate 0·3 gm. injected intramuscularly; 5 c.c. of a 10 per cent. solution of calcium gluconate and 25 c.c. of 12½ per cent. glucose were also given intramuscularly—the result was marked improvement. The injections were repeated on the next day and the recovery was uneventful. The point of interest in the case was: (1) No temperature in the axilla (2) intense headache on the first day, (3) semicomatose condition on the second day, (4) hæmaturia but no history of taking quinine for a long time and (5) rapid response to treatment with atebrin mussonate without any complication.

A dinner was arranged at the end of the meeting.

BENGAL PROVINCIAL COUNCIL

Extracts from proceedings of an emergent meeting held on the 7th November, 1940, at 7 P.M. in the Association Hall with Capt. J. C. Dey of Chinsura in the chair:

The draft annual report for the period ending 30th September, 1940, as circulated, was adopted with minor alterations and omissions.

The Secretary was directed to write a D.O. to the Hony. General Secretary, I.M.A., in connection with his letter dated the 5th November, 1940 and the resolution of the Provincial Council passed at its meeting held on 20th August, 1940.

The audited accounts for the period ending 30th September, 1940, as circulated, were adopted.

The provincial budget for the session 1940-41, as circulated, was adopted with some alterations as suggested by the Secretary.

Sunday, the 1st December, 1940, (4 p.m.) was fixed for holding the Annual General Meeting of the Indian Medical Association, Bengal Provincial Branch, at Khulna.

The report of the Rural Medical Relief Sub-committee was placed before the house.

Resolved that the matter be placed before the Subjects Committee of the Provincial Conference.

A letter dated 17-10-40 from the Hony. General Secretary, I.M.A. re: resolutions to be moved at the Annual Meeting of the Central Council, and a letter dated 24th September, 1940, from Dr. T. N. Ghosh re: terms of rapproachment with the Central Office, were placed before the house.

Resolved that the following resolutions be sent to the Hony. General Secretary, I.M.A. for submission at the next Annual Meeting of the Central Council of the I.M.A.—

(*i*) Resolved that the Rule 6C(*a*) be substituted by the following:

"Local branches shall be formed by the eligible members of the profession who reside or practise in a particular locality resolving to form themselves into a branch of the I.M.A. and getting the I.M.A. application forms signed by all persons wishing to join the I.M.A. through the said branch and forwarding them with the subscription for all members at the rate hereafter fixed and the names of its office-bearers to the Central Council, through the Provincial Branch if one exists in that State or Province. The Provincial Branch will consider them as soon as possible but in any case not later than two months after the receipt of the applications. If the Provincial Branch does not send its decision or refer the matter to the Central Council within the period specified, the Central Council shall proceed to deal with the case. In case the Provincial Branch does not recommend the recognition of the new branch, the Central Council before coming to a decision, shall refer the matter for re-consideration of the Provincial Branch, provided that the reply of the Provincial Branch to such reference should reach the Central Council within two months of such reference; in any case the Central Council shall proceed to deal with the case after two months of such reference. The proposed new branch shall be recognised as a branch of the I.M.A. if its formation is approved by a resolution of the Central Council to that effect."

(*ii*) *Amendment of Rule 8B(b):* In view of the changes made in Rule 6C(*a*) above, consequential changes be made in this Rule.

(*iii*) Resolved that the Rule 10B(*c*)—(page 10) be modified as follows:—

"In case of local branch members, out of the Rs. 3/- per member paid by the Branch, Re. 1/8/- shall be credited to the Provincial Branch and Re. 1/8/- to the Central Office."

(*iv*) Resolved that the Rule 15B(*a*) (*i*) be substituted by the following:—

(*a*) Every branch having not less than ten and not more than twentyfive members will elect one representative;

(*b*) For every additional forty members above twenty-five, the branch will get one extra representative, if constituted in any urban area; and for every additional twenty-five members, the branch will get an additional representative, if constituted in a rural area. For the purpose of this section, the branch in any municipal area shall be considered to be an urban branch and all other branches shall be considered to be rural.

BENGAL PROVINCIAL COUNCIL

Extracts from procedings of a meeting held on the 17th December, 1940, at 7 P.M. in the Association Hall with Dr. Nagendranath Bhattacharyya (senior), Khulna in the Chair:

A letter dated 3-10-40 from the first Assistant Secretary to the Secretary to the Bengal Legislative Assembly forwarding a copy of the Bengal Pure Food Bill, 1940, was placed before the house.

Resolved that a sub-committee consisting of the following members be formed with powers to co-opt and the sub-committee be asked to submit its opinion on the same before the next meeting of the Council:—Drs. M. U. Ahmad, P. C. Rakshit, K. K. Sen Gupta, Subodh Datta and Lt.-Col. A. C. Chatterji.

Resolved that a sub-committee consisting of the following members be formed to give effect to the resolutions passed at the fourth Bengal Provincial Medical Conference held at Khulna, by the end of February next:

Drs. Subodh Datta, K. K. Sen Gupta, Jibananda Mukherji, B. Banerjea, P. C. Roy, J. C. Bose and K. C. Chakraborty.

Resolved that one of the following three members be sent as a representative of this Provincial Branch to attend the Annual Meeting of the Central Council and the Vizag. Conference and the representative be requested to press the resolutions forwarded by this branch, before the next annual meeting of the Central Council:—1. Dr. K. K. Sen Gupta. 2. Dr. T. N. Ghosh, 3. Dr. B. Banerjea.

Further resolved that a sum of Rs. 35 be sanctioned towards the travelling expenses of the above representative.

Resolved that the letter dated 5-11-40 from the Hony. General Secretary, I.M.A. forwarding the payment of arrear subscriptions of nine members be considered as a joint application of all the defaulting members in the list and their names reinstated in the Provincial Register and their membership maintained in continuity.

The resolution to this effect was proposed by the Secretary and carried unanimously.

BENARES BRANCH

Extracts from the Annual Report of the Benares Medical Association for the year ending 30th September, 1940, the following were the Office-bearers during the year:

President—Capt. S. K. Chaudhuri, M.B.E., B.A., M.B.

Vice-Presidents—R. S. Capt. A. P. Misir, I.M.D. (Retd.), Dr. B. Thungamma, F.R.C.S.E.

Secretary—Dr. P. Roy, M.B. and Dr. K. N. Gairolu, M.D. (Vienna).

Treasurer—Dr. K. N. Gairolu, M.D. (Vienna).

Executive Committee—Drs. Bholanath, M.B., B.S., Gangu Singh, M.S.M.F., L.O., K. P. Tiwari, M.B., B.S.

Representatives to the Central Council—Capt. S. K. Chaudhuri, M.B.E., B.A., M.B., Capt. A. P. Misir, R.S.I.M.D.(R).

Representatives to the Provincial Council—Dr. Bholanath, M.B., B.S., Capt. A. P. Misir, R.S.I.M.D.(R)., Capt. G. S. K. Iyer, M.B., D.P.H. (Edin.).

No. of members at the beginning of the year—53.

No. of members at the end of the year—56.

New members enrolled during the year—6.

Meetings: Executive Committee 10, Special Committee 5, Sub-committee 2, General 10, Clinical 1.

Dr. J. N. Maitra, M.SC., M.B., D.T.M. delivered a lecture on Coronary Occlusion.

Activities: (1) Free treatment and injection for kala-azar and filariasis, (2) free treatment and operation of eye diseases in its winter (seasonal) hospital, (3) free training of compounders, nurses and midwives in its training class.

CALCUTTA BRANCH

Extracts from proceedings of the first meeting of the Executive Committee held on the 18th December, 1940 at 7-30 P.M. in the Association Hall with Dr. B. P. Tribedi in the chair:

A letter dated 22nd November, 1940, from the Hony. General Secretary I.M.A. re: amendment of certain rules to be moved at the next Annual Meeting of the Central Council by the Bengal Provincial Branch, and also draft rules regarding composition of the Working Committee, was considered.

Resolved that this branch endorses the amendments as proposed by the Bengal Provincial Branch of the I.M.A.

Further resolved that the numerical strength of membership of a province should be taken into consideration when the question of composition of the Working Committee comes up for discussion at the next Annual Meeting of the Central Council, and that two members should be nominated by the President, instead of three, as mentioned in item 1 (*c*) of the letter.

A letter dated 22nd November, 1940, from the Hony. General Secretary I.M.A. asking for opinion on the Bengal Medical (Amendment) Bill, 1937, by Mr. Anukul Chandra Das, M.L.A., was considered.

Resolved that this branch identifies itself with the views expressed by the Bengal Provincial Branch of the I.M.A. as embodied in its Annual Report for 1938-39 (pages 7 & 8).

The house regretted that the above opinion could not be sent earlier and in time to the Central Office.

A letter dated 7th December, 1940, from Dr. P. K. Guha resigning his membership of the Executive Committee was considered.

Resolved that Dr. Guha be requested to reconsider his decision.

A letter dated Nil (received on 17-12-40) from the Hony. Secretary, British Medical Association, Calcutta Branch, in connection with the local Emergency Hospitals Scheme, was placed before the meeting.

Resolved that the Secretary be asked to intimate to the Secretary, B.M.A., Calcutta Branch, informally that this Association would welcome the consideration of the Emergency Hospitals Scheme if a direct approach to this Association is made by the Government.

Resolved that one representative out of the following three members be sent to the All-India Medical Conference to be held at Vizag. and that an amount not exceeding Rs. 35 be sanctioned for the purpose:—Dr. P. C. Roy (Hony. Secretary), Dr. T. N. Ghosh, Dr. B. B. Banerjea.

Resolved that the first Monday of every month be fixed as the date for holding the Committee Meeting at 7-30 P.M.

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Extracts from proceedings of a meeting of the Executive Committee held on the 6th January, 1941, at 7-30 P.M. in the Association Hall with Dr. K. C. Chakraborty in the chair:

Resolved that the office of the Medical College Re-union be accommodated in this Association premises at a rental of not less than Rs. 50 for the whole term.

Resolved that there should be four sub-committees, viz. Library sub-committee, Scientific Sub-committee, Social Functions Sub-Committee and the Sports Sub-Committee.

Further resolved that there should be seven members in each Sub-committee with powers to co-opt up to two further members; co-option may be done at any time during the year. Each sub-committee should consist of four elected members. as also the President, the Secretary and one of the Assistant Secretaries.

(*a*) *Library Sub-committee:* Drs. K. K. Sen Gupta, J. C. Banerjea, Capt. M. Mukherjee, Drs. B. Banerjea, R. Sinha (Asstt. Secretary).

(*b*) *Scientific Sub-committee:* Drs. P. Sur, T. N. Ghosh, Subodh Datta, J. C. Banerjea, R. Sinha (Asstt. Secretary).

(*c*) *Social Functions Sub-committee:* Drs. Bolin Ghose, Hirendra N. Chatterjee, M. Kumar, M. U. Ahmad, J. K. Majumdar (Asstt. Secretary).

(*d*) *Sports Sub-committee:* Drs. Biren Chatterjee, Suresh Chandra Datta, Bibhuti Palit, Haralal Seal, J. K. Majumdar (Asstt. Secretary).

Resolved further that the Secretary should call the first meeting of each sub-committee and that these sub-committees will elect their own Conveners at these first meetings.

The following seventeen members of this branch were elected representatives to the Bengal Provincial Council of the I.M.A. for the session 1940-41:

Drs. Hiren Chatterjee, J. Chakraverti, A. K. Bose, Capt. M. Mukherjee, Drs. J. C. Banerjea, P. C. Roy, T. N. Ghosh, P. K. Guha, A. K. Acharya, K. C. Chakraborty, J. C. Bose, P. Sur, Sambhu Mukherji, R. Sinha, A. D. Mukherji, Probodh Kumar Banerjee, Sachin Das.

Capt. M. Kumar was elected a member of the Executive Committee vice Dr. P. K. Guha resigned.

DOARS BRANCH

Extracts from proceedings of the Annual General Meeting held on the 25th January, 1941, at 3 P.M. at Gopalpur Tea Estate with Dr. G. N. De in the chair:

Office-bearers for the current session:

President—Dr. G. N. De.

Vice-President—Dr. T. M. Ghose.

Representative to the Central Council—Dr. T. M. Ghose.

Representatives to the Provincial Council—Dr. S. K. Kundu, Dr. K. C. Banerjee.

Executive Committee—Drs. G. N. De, S. K. Guha, K. C. Banerjee, P. K. Banerjee, S. K. Kundu.

DACCA BRANCH

Extracts from proceelings of a general meeting held on 9-2-41 in the Dacca National Medical Institute premises with Dr. H. Ganguly in the chair:

The following gentlemen were elected office-bearers for the year 1940-41:

President—Dr. J. C. Das.

Vice-Presidents—Dr. N. Banerjee, Dr. S. C. Roy.

Secretary and Treasurer—Dr. H. Ganguly.

Executive Committee—Dr. D. N. Basak, Dr. R. K. Banik and the other office-bearers *ex-officio.*

JALPAIGURI BRANCH

Extracts from proceedings of the Annual General Meeting held on 26-1-41 at 7 P.M. in the drawing room of Late Dr. S. C. Sen-Gupta's Residence:

The following were elected office-bearers for the year 1940-41:

President—Dr. A. D. Guha Neogy, M.B.

Vice-President—Dr. A. K. Bhoumick, L.M.F.

Jt. Hony. Secretaries—Dr. S. C. Bhowmick and J. C. Ghosh.

Asst. Secretary—P. C. Saha, L.M.F.

Treasurer—Dr. S. C. Bhowmick, L.M.F.

Auditor—Dr. R. N. Sen Gupta, M.B.

Managing Committee consisting of (*a*) President, (*b*) Vice-President (*c*) Jt. Hony. Secretaries (*d*) Asst. Secretary and Dr. R. N. Sen Gupta, was formed to conduct the ordinary business of the branch and to advise the Secretaries in difficult and complicated matters.

Representative to the Central Council—Dr. A. D. Guha Neogy, M.B.

Representative to the Provincial Council—Drs. S. C. Bhowmick, R. N. Sen Gupta, M. Ahammad, A. K. Bhowmick.

KRISHNA DISTRICT MEDICAL ASSOCIATION

Extracts from proceedings of the monthly meeting held on the 21st December, 1940, at Masulipatam in the Local Town Hall with Dr. M. Seshacharyulu, L.M.S. *in the chair:*

The following members were elected delegates to the XVII All-India Medical Conference to be held at Vizagapatam: Drs. K. Venugopaulrao Naidu, L.M.S., C. Subbrao, M.B., B.S., S. Sri Rama Rao, L.M.P., N. Ramarao, L.M.P., K. Kuppuswamy, M.B., B.S., C. Appalachary, L.M.P., V. Lakshmandas, M.B., B.S.

The following papers were read: (1) A case of acute nephritis treated with Sulphanilamide by Dr. K. Kuppuswamy, M.B. B.S., Masulipatam. (2) Physiology of human desires by Dr. Y. S. Chowdary, L.M.P., Mudinepalli. (3) Causes of chest pain by Dr. N. Ramarao, L.M.P., Gollapalli.

A case of stone in the bladder and a case of ruptured uterus were reported by Dr. M. V. Subbarao, L.M.P., Masulipatam.

The members assembled to dinner at 8 P.M.

KRISHNA DISTRICT BRANCH

Extracts from the Secretary's Report for the year ending September, 1940:

In the usual course we ought to have had the annual meeting during October. Unfortunately for some inconvenience we have postponed the date till to-day.

Our beloved President Lt-Col. T. S. Shastry, I.M.S., who has been re-called to the Military Service has left us in the middle of June, 1940, and Capt. K. Venugopaulrao Naidu, L.M.S., the Assistant District Medical Officer-in-charge was elected and functioned as President till 19th September, 1940, when Dr. G. J. Pacheco, L.M.S., the new District Medical Officer has been elected President, vice Capt. K. Venugopaulrao Naidu, L.M.S., having resigned. In the circumstances of our Medical Association it is thought a District Medical Officer would be able to command greater amount of influence upon the members to the medical profession, mostly Medical Officers in the villages.

In this connection we have to place on record our appreciation of the services and incentive taken by Colonel Shastry now in the Hyderabad Branch of the I.M.A., who is responsible for the stability of our District Branch and also for the formation of the Andhra Provincial Branch. We have also to thank Capt. K. Venugopaulrao Naidu who took a great deal of interest in the Association by taking the members to the Hospital holding bed-side demonstrations. They were very much appreciated by the members.

Now we welcome Dr. Pacheco, as our President and he has to take us through the various stages of our Association and we hope he will do so with success.

There is a feeling among our members that a subscription of Rupee one which we collect per month is rather too heavy and some are thinking of abolishing the night dinners and some others for retaining them. In view of the settling of the question of dinners we commend to the members at large to review the question of subscription. At any rate Rs. 3 per year must be paid to the Central Council. Now that the Provincial Council having been formed, a portion of the subscription namely rupee one per head will be refunded by the Central Council to the Provincial Branch of the Association for its work and we are glad to say the Headquarters of the Andhra Provincial Branch is now situated in Masulipatam and the Honorary Secretary is one of our own colleagues Dr. S. Hanumantharao, L.M. & S., Masulipatam.

We have noted with regret that certain members of our Association are gradually resigning from our Branch. We cannot very well understand the reasons behind that move. It is always advisable that we as medical people should combine and mix in a corporate body like our District Medical Asso-

ciation which had similar branches all over India. It is for such of those who have resigned to reconsider their attitude and bring the grievances they have to the notice of the Association and try for their rectification. The resigning from the Association is not, we are sure, the remedy for it.

We request them once again to withdraw their resignations and make our Association a strong body and by doing so strengthen the Provincial Organisation of our Andhra Districts.

KRISHNAGAR BRANCH

Extracts from proceedings of an emergent meeting called on the 16th Feb., 1941 to mourn the sudden death of Dr. S. K. Mukherji, F.R.C.S., D.O.M.S., the great Ophthalmic Surgeon of Calcutta:

All the members were present.

The following resolution was passed unanimously:

"Resolved that this meeting of the members of the I.M.A. Krishnagar Branch, expresses its deep sorrow at the sudden and untimely death of Dr. S. K. Mukherji, F.R.C.S., D.O.M.S., who was not only an unrivalled Ophthalmic Surgeon of international fame but also by his exemplary character and independence of views made himself respected and renowned as one of the foremost men in our country.

Resolved further that a copy of this resolution be sent to his family as a token of heart-felt condolence to them by this Association at their bereavement with which this Association also associates itself."

MADURA BRANCH

Extracts from proceedings of a meeting of the Madura Medical Association held on the 1st January, 1941, at the Government Erskine Hospital, Madura with Major Sheppard, I.M.S., in the chair:

Before the meeting the chief guests, Dr. Bidhan Chandra Roy, M.D. (Lond.), M.R.C.P., F.R.C.S. (Eng.) and Lt.-Col. J. L. Sen, I.M.S. (Retd.) were taken round the hospital by Major Sheppard, I.M.S. and shown the various departments.

The Chairman in a short speech welcomed the chief guests. Dr. Bidhan Chandra Roy then addressed the members. An earnest plea to the young men of the medical profession to live by compromise and adjustment, to do their utmost to serve the poor, to develop an *esprit de corps* among themselves and focus expert opinion in such a way as to command the respect of the government and the public, was made by him. He further suggested that they should have taken advantage of the excellent hospital in Madura to develop a post-graduate department there. He confessed that he has not seen a District Hospital so well laid out and so lavishly supplied with all the materials that are essential for the relief of human pain and suffering as ours in Madura.

Continuing he said that we should press the needs of the profession before the government, particularly for the recognition of the Association as a body which was looking after the interest of the profession as well as giving expert advice and guidance to the Government, whenever required. He wished that the Government would see its way at an early stage to to make the staff of the Hospital so big and so efficient that it might be turned into a centre for post-graduate study.

Another aspect in which the medical profession ought to interest itself, he said, was to devote more attention to the preventive side. In view of the poverty of the country this aspect was, in his opinion, most imperative.

With the concluding remarks of the President and a vote of thanks by the secretary the meeting came to a close.

On behalf of the Madura Medical Association, the Secretary conveyed through Dr. Roy the good wishes to Bengal and the associations there.

MORADABAD BRANCH

Extracts from the Secretary's Report for the year 1939-40:

The last annual meeting took place on the 29-4-1939 and the following office bearers were duly elected at the same:

President—Dr. K. B. Dikshit.
Vice-President—Dr. Bhola Nath Sharma.
Hony. Secretary—Dr. J. N. Ganguly.
Hony. Joint Secy.—Dr. Mashkur Ahmad.
Hony. Treasurer—Dr. R. P. Vaish.
Hony. Auditor—Dr. Jagdish Saran Agarwal.

Drs. A. A. Khan, A. E. Stevens, R. D. Bhargawa and B. M. Gupta were elected as members of the Executive Committee.

Dr. J. N. Ganguly was elected as the representative of this branch on the Central Council of I.M.A. Drs. J. N. Ganguly and Bhola Nath Sharma on the Provincial Council of the Association, Drs. Hansraj and Mashkur Ahmad on the Health Committee of the local district and municipal boards respectively. Since both the boards have now been superceded by the Government for a period of 3 years and as such I do not expect we shall be called upon to send up a representative to offer our co-operation to either of the boards for the next 3 years.

Later in the year it was decided to have no permanent President but to elect a Chairman for each meeting. On Dr. Gupta's leaving the station Dr. K. L. Kapoor was elected in his place on the Executive Committee. I may be permitted also to add that the elected Executive Committee never held a meeting, as all the questions that required to be considered and settled were disposed of at the general meeting.

Membership—There were 20 members on the roll on 1-5-39, 15 joined and 7 left during the year. The total number at the end of the year was 28. One of our members, Dr. Shawan, to our great regret, died during the year. Drs. Shome and Hazura Singh were transferred to Cawnpore and Gangoh (Saharanpur) respectively and the names of Drs. K. L. Kapoor and R. B. Singhal were removed for non-payment of dues. R. B. Dr. P. L. Gupta having shifted to Chandausi wanted to resign but at our request he continued to be an out-side member for several months and the journals received by the Association were sent to him over there. This arrangement however proved not only too expensive but also unsatisfactory. He also finally chose to resign the membership.

Resolutions of condolence at the sad demise of Dr. Dhawan and R. S. Dr. Suraj Mal Saran, President I.M.A., U.P., were duly passed and communicated to their respective families.

Meetings—There were in all 18 meetings of the Association held during the year. The meetings were regularly attended by a good number of members and no meeting had to be adjourned for want of quorum. I think this is a point on which we should congratulate ourselves in as much in previous years, neither the total number of meetings held was so large nor the average attendance of the members there at so satisfactory. Besides transacting ordinary routine business, we discussed many clinical cases that were brought in and this served to make the sittings both intersting and useful.

Discussions were also held on the effect of excessive heat on health, and the recent epidemic of sand-fly fever where as papers on infantile liver by Dr. B. P. Gupta, treatment of typhoid fever and management of marasmic babies by Dr. J. N. Ganguly and on dysentry by Dr. J. S. Agarwal were read and discussed.

Journals—Two new journals *i.e.* the Medical Review of Reviews and the Journal of the American Medical Association were subscribed during the year, and these with the I.M.G. and Practitioner make up 4 journals altogether which the Medical Association now subscribes. The circulation of these journals to out-side members had to be discontinued because it involved considerable delay and expenditure.

This report will be incomplete if I did not mention here the kind help and co-operation which I had invariably received from my colleagues and which enabled me to carry on the responsible duties of the office of Secretary. I feel I must acknowledge with thanks the help rendered particularly by Drs. K. B. Dikshit, Bhattacharya and S. D. S. Tyagi. Lastly, I must place on record our gratefulness to Col. Malhotra, I.M.S., for his uniform courtesy and unfailing help extended to us and for so kindly placing his office room at the disposal of the Association to hold its meeting.

RAMNAD BRANCH

Extracts from proceedings of the Eleventh Annual Gathering of the Ramnad District Medical Association celebrated at Kanadukathan on the 19th October, 1940 with Major Sheppard, I.M.S., in the chair :

34 members from the district and 29 guests from Trichy, Pudukottah and other places were present.

The following were elected office-bearers for 1940-41:

President—Dr. P. Janardhana Rao.
Vice-President—Dr. N. C. Appayya.
Secretary—Dr. T. V. Appaswami.
Joint Secretary—Dr. Miss E. Ivatts.
Treasurer—Dr. S. Subramaniam.
Committee Members—Drs. T. S. Shetty, K. R. Rathnaswami, V. S. Ramachandran, Miss P. Rajam.
Auditors—Drs. Muthiah, Janaki.

After tea, music and a group photograph, the general meeting was held when Major Sheppard, I.M.S., delivered a lecture on Emergency Surgery—Acute Abdomen. Dr. M. Manjunath Rai, F.R.C.S., M.B., B.S., D.M.R.E., Radiologist, Madras, delivered a lecture on Radiology—Therapeutic.

Drs. T. S. Shetty and E. Ivatts were hosts of the evening and dinner was served to all the members.

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Extracts from proceedings of the monthly meeting held in the O.V.C. High School, Manamadura on 18th January, 1941. with Dr. Janardhana Rao, the president in the chair:

The members present were entertained to tea by Dr. T. V. Appaswami.

The president appealed to the members to take increased interest in the war fund collections and wished that the year 1941 should bring peace to the whole world.

He then lectured on 'Puerperal Sepsis'—its latest conception and treatment. The importance of abdominal palpations, against frequent vaginal examinations, administration of anæsthesia in the application of forceps, and the wearing of face masks by doctors and nurses was stressed during the discussion that followed.

Dr. Shetty and Dr. Appayya gave reports respectively of a case of abdominal abscess opening through the umbilicus discharging large quantities of pus and a case of fever in an adult woman with eruptions confined only to the abdomen.

U. P. PROVINCIAL BRANCH

Copy of the letter No. 4677-79 dated 12-12-1940 from Colonel T. C. Boyd, F.R.C.S.I., M.R.C.P., D.P.H., I.M.S., addressed to the Hony. Provincial Secretary, I.M.A., U. P. Provincial Branch, Town Hall, Meerut, for favour of information and circulation amongst the members of the branches.

"In continuation of this office letter No. 3952/-54/C-97, dated October 23, 1939, I have the honour to inform you that the Government of India has now sanctioned as a permanent measure the direct issue, on demand, of prophylactic vaccines from the Central Research Institute, Kasauli, to the local bodies and registered medical practitioners without requiring the approval of the Director of Public Health or the Administrative Medical Officer.

"Kindly bring this fact to the notice of all the members of your Association, including the members of your Association's district branches, if any."

SOUTH ARCOT BRANCH

Extracts from proceedings of the meeting held on 18th January, 1941, with Dr. V. Krishnamurthy, the President, in the chair :

The Secretary informed the house about the formation of the Provincial Branch of the Association.

The House considered the suggestion of the Secretary to collect the lectures and have them printed in a volume at the end of the year, and resolved in favour of it by a large majority.

The President gave detailed reports of the following cases met with in his practice. He pleaded for a thorough and detailed examination of each system lest some gross malady is overlooked.

1. A large iliac abscess which simulated an intra-abdominal cyst on account of its large size. The abscess was consequent on Pott's disease of lumbar vertebræ—the deformity was overlooked for sometime.

2. The second case was a small vescical calculus that he removed which had grown in a silk thread used to tie the sac when the patient was operated on for hernia some years back. It was explained that in ligaturing the sac the bladder was accidentally included and the silk that was used had gradually worked its way into the bladder where it formed a calculus.

3. The third case was a supposed bubo that was opened and which resulted in a fæcal fistula. In this case, it was mentioned, that it was a Richter's hernia, where the gut wall had necrosed completely producing the fistula. By a later operation the patient was cured of the fistula.

4. The fourth case was a case of hydrocele admitted for operation. The patient appeared very much emaciated and ill. Careful examination revealed that the patient was suffering from empyema, which was treated suitably.

5. The next case cited was a case of hydrocele, communicating with a large retroperitoneal cyst by a narrow canal in the region of the Inguinal canal. This was operated in two stages.

6. Ectopic gestation was the next case cited by the president. The tubal pregnancy had ruptured and patient was having the signs of internal hemorrhage. The patient was operated and as she was recovering she was running temperature with fullness and accumulation in Douglas' pouch. When this was drained by an incision in the posterior fornix, pus and the ovum escaped. Patient recovered.

The members were entertained to tea by the president.

TRICHINPOOLY BRANCH

Extracts from proceedings of the monthly meeting of the Trichinopoly District Medical Association held on the 24th January, 1941, in the premises of the Trichy, X-Rays, Ltd., Trichinopoly, with Major-General N. M. Wilson, C.I.E., O.B.E., K.H.S., I.M.S.,Surgeon-General with the Government of Madras in the chair:

Dr. P. A. S. Raghavan, the Managing Director of the Trichy X-Rays, Ltd. and Secretary of the Association was "At Home".

Dr. N. N. Sujeer, L.M. & S., the President of the Association, welcomed the Surgeon-General in suitable terms and wished Major-General Wilson long life and peace in his retirement, as he is shortly to retire.

The Surgeon-General thanked the members for giving him an opportunity to meet so many professional brethren and called upon the Secretary to give a resume of the activities of the Association during the year. The Secrtary giving a short account of the activities of the Association said, that in addition to the clinical meeting held during the year, due to the impetus given by Dr. T. S. S. Rajan, who was the president of the association during the greater part of the year, the members participated in the Health Exhibition conducted at the time of the 2nd All-India Khadi and Swadhesi Exhibition at the Puthur Maidan, Trichy. They concentrated upon four subjects, *i.e.*, ante-natal service, tuberculosis survey, propaganda of nutrition and diet, and vaccination, and he hoped that with the guidance of the new President, Dr. N. N. Sujeer, the members would carry on more public activities. He then said that the Association which had been an active body for a number of years communicated its approval to the Government, of the five year limit for Honorary Medical Officers. He hoped that the Government would consult the Association on medico-political affairs as this was a branch of the Indian Medical Association. He wished that all medical men would join the Association so as to strengthen the same.

Major F. A. B. Sheppard, F.R.C.S., I.M.S., District Medical Officer, Madura, then delivered a lecture on Inguinal Hernia and he discussed the causes and the pathology of the same. He gave details of various kinds of operations and hoped that in future years statistics of recurrences might be gathered, which would be a great aid for improving the technique of different operations.

In his concluding remarks Major-General Wilson thanked Major Sheppard for his illuminating lecture on hernias and humourously remarked if ever he were to get hernia he would rush to Major Sheppard and get himself operated. He complimented Major Sheppard as one of the best surgeons, not only in Southern India but, in India itself.

Major-General Wilson then explained in detail the Reorganisation of the Honorary Medical Service which he has proposed to the Government and his scheme was that the Honorary Service should be divided into three sections, *i.e.*, for beginners there will be Honorary Clinical Assistantship for two years, which would carry Rs. 50/- per month and the next was Honorary Assistant Surgeonship and Physicianship, which would continue for five years and which would be recruited from the Clinical Assistants and would carry a salary of Rs. 75 per mensem. Next and the third would be the Honorary Physicianship and Honorary Surgeonship which would carry no remuneration, as experienced medical men are bound to give their services free to the poor. He said that the present honorary incumbents are also eligible for the remuneration when the new scheme came into operation. To a question from a member he replied that mere possession of foreign qualifications would be no criterion for any appointment, but only experience and professional skill will be taken into consideration. To another question he replied that even retired people might be appointed as Honorary Surgeons and Physicians provided they are physically fit and mentally capable.

MEDICAL NOTES AND NEWS

RADIUM TREATMENT IN KING GEORGE HOSPITAL

Shaikh Mohammad Habibullah, the Vice-Chancellor, Rai Bahadur Dr. B. N. Vyas, the Honorary Treasurer, Dr. W. Burridge, the Dean, Faculty of Medicine, and Rai Bahadur Dr. Raghunandan Lal, Radiologist, waited in deputation on his Excellency the Governor recently in connection with radium and a super-voltage deep therapy plant for the King George's Hospital. They explained to his Excellency the urgent need for radium and a plant therefor both as a provincial necessity and for the purposes of meeting present-day requirements. They further urged that during the last war many soldiers were treated in the hospital, and radium and deep therapy plant may be required in case such an emergency arises again. They also emphasized that for a large province like the United Provinces there was no arrangement for radium treatment and the existing deep therapy plant in the hospital was old and inadequate for the requirements of treatment.

His Excellency gave them a most sympathetic hearing, as his Excellency takes deep and genuine interest in the expansion of hospitals.

RESTRICTION ON EXPORT OF MEDICINES

The export of medicines manufactured in India or Burma, which have as their ingredients one or more of the essential imported drugs will henceforth require the permission of the Government of India, according to information received here.

Uptil now there was no restriction on the export of medicines and drugs, for which licences were issued freely for export to any permissible destination.

The manufacturers may, however, apply for a general exemption for export of a particular preparation by furnishing the Government with the percentage of each ingredient in that preparation.

TATA CANCER HOSPITAL, BOMBAY

His Excellency the Governor of Bombay on 28th February, last inaugurated the Tata Memorial Hospital for cancer in Bombay. This is the first fully equipped cancer hospital in India.

Sir Sohrab Saklatwala after welcoming His Excellency said that the Hospital was dedicated to the treatment and study of cancer and allied diseases and their object had been to make it a model of its kind throughout the East.

After dealing with the considerations which persuaded them to start a Cancer Institute instead of Radium Institute and narrating in brief the history of the project he said that with very few exceptions the hospital staff had been manned almost entirely by Indians. The benefits of the Hospital were not to be restricted to any race or creed.

Dr. John Poole, the First Surgeon, testified that he had never seen a Cancer Hospital with every one of its departments better equipped than this Institution.

Treatment, education and research, he said, were the three spear-heads of the modern offensive against cancer and the Hospital embodied the elements in balanced proportions.

On the clinical side accommodation would be gradually provided upto 100 beds. Treatment would be given without charge to the poor.

The Hospital would also impart training in surgery, radiology, social work, nursing, and laboratory technology.

KAMALA NEHRU HOSPITAL

Mahatma Gandhi performed the opening ceremony of the Kamala Nehru Memorial Hospital on the 28th February last.

Mrs. Uma Shanker Dikshit, Secretary of the Hospital, read out messages of goodwill received from all over the country, including Mrs. Sarojini Naidu, Sir Tej Bahadur Sapru, Mr. Aney, and Dr. B. C. Roy.

Among those present on the occasion were Dr. Rajendra Prasad, Dr. Syed Mahmud, Dr. Jivraj Mehta and Pandit Ladli Prasad Zutshi, all trustees of the Hospital.

Dr. Jivraj Mehta formally requested Mahatma Gandhi to open the Hospital.

Mahatma Gandhi opened the main gate of the Hospital with a silver key, returned to the rostrum and addressed the audience.

"This is a mission of mercy and service. This hospital is for the poor mainly. It is neither for Hindus alone nor for Muslims alone. It is for all alike without distinction of caste or creed or community, because disease and death are with us all without any such distinction," said Mahatma Gandhi in his speech.

Gandhiji said: "Our word to collect Rs. 5 lakhs stands fulfilled to-day, as we have been able to collect Rs. 5,10,000. But this is not enough. This is a very big hospital and one of the finest in the country. In its maintenance all should help with whatever mite they can. The United Provinces Government have been very generous. The Allahabad Municipality has been very generous. We are also grateful to the various donors for their contributions."

Mahatma Gandhi said that as soon as control of the Hospital had been decentralized the responsibility of maintaining the Hospital would mainly be of the local people. He specially thanked Pandit Madan Mohan Malaviya for coming in person despite failing health to bless the function.

"This is a sacred moment, and all those who have assembled here have taken part in this consecration and have given their blessings. The mission of this Hospital will ever be 'service to all alike'."

Mahatma Gandhi regretted the absence of Pandit Jawaharlal Nehru, Mrs. Vijayalakshmi Pandit and Miss Indira Nehru on the occasion. He said that he seriously considered whether the formal opening ceremony should have been performed in view of their absence. But he agreed with Dr.

Jivraj Mehta that good work would be begun with the ceremony. Pandit Nehru also agreed to this proposal. Still it was a matter of deep regret that none of the Nehru family could be present on the occasion, except Mrs. Krishna Hutheesingh and the daughters of Mrs. Pandit.

After addressing the audience, Mahatma Gandhi appealed for funds for the Hospital. He also announced a number of donations which he had received or been promised during the course of the last few days. The total contributions for the Hospital now exceed Rs. 5 lakhs. The response to Mahatma Gandhi's appeal on the spot was very generous.

Earlier in the day, Mahatma Gandhi went round the Hospital and personally inspected the various wards and arrangements.

"The Managing Committee felt that they would not be justified in opening the Hospital without that minimum celebration which the opening of the national monument in memory of a noble lady, the embodiment of service to humanity, necessitated and, therefore, they were constrained to request you to come over here and open the monument whose corner-stone was laid by you 15 months ago," said Dr. Jivraj Mehta, requesting Mahatma Gandhi to open the Kamala Nehru Memorial Hospital formally this afternoon.

He pointed out that Mahatma Gandhi himself had insisted that there should be no lagging behind in constructive work. Dr. Mehta, proceeding, thanked the U. P. Government for their very handsome donation of Rs. 30,000 towards the construction and equipment of the Hospital and for an annual recurring grant of Rs. 5,000.

He also thanked the Allahabad Municipal Board for their grant, and other donors. Appealing for more endowments, Dr. Mehta said, "A large endowment fund is necessary. If any help is not forthcoming, we shall be in the unfortunate position of having our funds disappearing during the course of 10 years and the Hospital may have to be closed. Such contingencies, however, the trustees would refuse to consider.

"The position of the Hospital demands that there should be at least an endowment of Rs. 5 lakhs to ensure its proper development."

Dr. Jivraj Mehta made special mention of the efforts that have been made by various newspapers throughout the country. The *Hindustan Times,* New Delhi, had been able to collect Rs. 20,000; the *Hindu* of Madras had collected Rs. 4,500; the *Janmabhoomi* of Bombay over Rs. 1,500; and the *National Herald* Rs. 5,000 .

SYMPOSIUM ON ORGANIZATION OF THE CHEMICAL AND PHARMACEUTICAL PROFESSIONS IN INDIA

In presiding over the Symposium Dr. J. C. Ghosh, D.SC., F.N.I., Director, Indian Institute of Science, Bangalore, said:

I thank you for the honour you have done me by asking me to preside over this symposium on the Organisation of the Chemical and Pharmaceutical Professions in India. There was a time when a chemist and a druggist were often the one and the same individual—a visionary searching for the elixir of life. With the development of modern science and increasing specialisation, the professon of Pharmacy has been differentiated from that of chemistry, but there exist in all the enlightened countries of the world the closest ties between the two professions. In India, however, the medical organisation has so far regarded the medical men both as physicians and pharmacists and has not recognised any independent profession of pharmacy. This was perhaps natural in the early stages of the application of medical science in India, but the manufacture and dispensing of drugs have now reached a scientific basis and become the jobs of specialists and the sooner it is so recognised in India the better for us all.

The war is an ill-wind, but it has blown at least one good thing—the public are now keenly anxious for a proper development of the pharmaceutical industry and a proper organisation of the pharmaceutical studies in the country. The Drugs Act passed by the Central Legislature in the midst of the preoccupations demanded by a modern war, is a welcome measure; the Government of India has also given the assurance that a comprehensive Pharmacy Bill will be taken up in near future, and has expressed the hope that the twin measures will so regulate the import, manufacture and sale of drugs and organise the profession of Pharmacy that the Indian public will have a very efficient service in a matter of such vital concern to the nation.

In the public mind, the distinctive service now associated with the pharmaceutical profession is the compounding of prescriptions and the dispensing of drugs and medicines. This is no doubt a responsible service, but the interest of the pharmaceutical profession are now very much wider. In old days, the apothecary used to make in a shop all the pills, tinctures and extracts which the physicians prescribed but the base of most of these pharmaceutical operations has now been transferred from the apothecary's stores to the factory of the drug manufacturer; it is here that the chemist and pharmacist meet; and the medical men, as we generally know them are not of much help. I do not wish to be misunderstood. There are medical men in India who have made special study of chemistry, are even Fellows of the Institute of Chemistry and who will be given a place of honour in any assembly of chemists and pharmacists. But there are also medical men, who, to my personal knowledge, enquire why magenta cannot be used in place of potassium permanganate which is now difficult to obtain because of the war. It is in the fitness of things that the Government of India decided to appoint a distinguished chemist as the Director of Drug Supply and we all welcome the announcement that Professor Dr. J. N. Ray has been offered this responsible position. If this collaboration of chemists and pharmacists is to be a success it is essential that the teaching of pharmacy in the country should be organised on a proper scientific basis. I do not wish to make any observation on the facilities for the training of a chemist in India, for the simple reason that such facilities exist though in a very inadequate measure while in the field of pharmaceutical education we have practically a clean slate to write upon. There was no provision for the teaching of Pharmacy in any of the Universities of India until 1937 when the Benares Hindu University with commendable foresight introduced a three years' comprehensive course leading to the degree of Bachelor of Pharmacy.

Sometime ago, the Government of Bengal appointed a Committee to draw up a scheme for a College of Pharmacy when Dr. Anklesaria promised a donation of two lakhs of rupees for the establishment of the College. It is not known how far the scheme has progressed, but the curriculum was drawn up on right lines, a proper balance having been struck on the relative claims of the various branches of science—chemistry, pharmacognosy and physiology—in the training of a phramacist. In Madras, the Universities have been more alive to the needs of higher pharamaceutical studies and the subject now forms a part of the B.Sc., degree course.

These are pointers in the right direction. The administration of the Drugs Act and the proposed Pharmacy Act should create a continuous demand for highly trained Pharmacists and Pharmaceutical Chemists. We are glad that the Central Drug Technical Advisory Board include two representatives of the Indian Chemical Society and it is hoped that the promise of the Hon'ble Member in Charge of the Drugs Bill that proper representation will be given in the Board to the organised Pharmaceutical Profession of the country will soon be implemented. There is no valid reason why the provincial Governments should not follow in the footsteps of the Central Government in the matter of formation of the corresponding Boards in the provinces. Indeed the Council of the Indian Chemical Society has expressed the opinion "That the Provincial Committees which may then be set up in order to give effect to the recommendations of the Drugs Technical Advisory Board should consist of (1) Pharmaceutical Chemists, (2) Bio-chemists, (3) Technical Chemists, (4) Botanists with special knowledge in Pharmacognosy, (5) Pharmacologists, (6) Bacteriologist, (7) Medical Men and (8) Veterinarians. The function of the Pharmaceutical Chemists is particularly important, as over 90 per cent of pharmaceutical assays and analyses are chemical in nature and the prepondering role of chemistry in pharmacy and drug standardization is recognised in every civilized country. The Council of the Indian Chemical Society desires to emphasise this point, as in certain provinces there are indications of a tendency to form *ad hoc* nuclei for the formation of provincial laboratories even before the Drugs Technical Advisory Board has been set up." In time to come we may reasonably expect that these Boards in consonance with enlightened public opinion will be able to enforce the policy of appointing qualified pharmacists and pharmaceutical chemists to responsible positions in public health laboratories, excise laboratories, drug control laboratories, custom laboratories, the inspectorate under the Drugs Act and similar State and Municipal Services.

These are onerous duties, and should be well performed by trained experts. We also need highly trained experts who will be in the main, responsible for the manufacture of pharmaceutical preparations in the country. It is very desirable therefore that the Central Government should supplement the efforts of the Provincial Governments and the Universities for providing the facilities of pharmaceutical training by liberal grants. The Drugs Enquiry Committee recommended that funds might be raised for this purpose by the imposition of an extra five per cent duty on imported drugs and by the levy of suitable excise duty on proprietary medicines manufactured in India. Whenever in India there has been a public demand for the large scale development of industries the counter-suggestions has been made that such development is not possible for lack of experts. Again, provision of facilities for training experts in India has been objected to on the ground that there is little likelihood of the absorption of such experts in indigenous industries. A determined attempt must now be made to break this vicious circle; and the custodians of public funds should be presented with the united demand of the people that their purse-strings should always be kept open for training in our own country, the technicians that we require for our industrial development. The development of the pharmaceutical industry is a part of this bigger problem and in view of its intimate relationship with the health of the nation should receive the immediate attention of the public and the Government.

There is considerable confusion in the public mind as regards the legitimate scope and activities of a Pharmacist and a Pharmacologist. I hope the discussions in this Conference will clear up the problems at issue. In his Presidential Address Mr. Bal has stressed the need of improving our knowledge of plant materials from which drugs are prepared and the methods of preparations, and has shown how this branch of pharmacy offers unlimited scope for work particularly in this country. The modern pharmacist is also vitally concerned with the preparations of drugs of non-vegetable origin by chemical methods and with the standardization of all pharmaceutical substances. Pharmacology on the other hand is mainly concerned with the clinical evaluation of all drugs, actual or potential. The ideal which should be kept in view, is, that each branch of science should be mistress in its own house, but the votaries should always work in intimate co-operation. Aristotle is said to have stated that the search for truth is in one way hard and in another easy, for no ardent seeker can grasp it fully nor miss it wholly; but each adds to the knowledge of nature, and from all the fact assembled there arises a great grandeur. This is even more true to-day than it was 2,500 years ago. It is in persuance of this spirit of a co-operative enterprise for building up the edifice of science and industry in this land that I would also plead for a change in the outlook of our chemists. It is unfortunate that the opportunities of the chemical profession have been very limited till now—the two major avenues for employment being the teaching profession and analytical work in technical laboratories. In the rapidly developing large-scale industries of the country, *e.g.,* metullurigical industry or the sugar industry, the chemist has played a secondary role; in fact the works chemist in a sugar factory has a pitiable lot. The average chemist in India has had his training in institutions with a purely academic outlook where knowledge and experimental skill are acquired for their own sake, and researches are undertaken with a view only to advance the bounds of knowledge without any consideration of utility. There is much to be said in favour of this attitude but in the strenuous times that are ahead of us, we cannot afford to ignore the utilitarian aspects of chemical knowledge and experience. The average young student of chemistry should be trained with the object of making him fit for tackling the large scale prob-

lems that arise in industries or for investigations intended to alleviate human suffering. It is in this latter field that synthetic chemists or pharmaceutical chemists have yet to make their rich contributions; and they can do so only in collaboration with pharmacologists or pharmacists. The rapid advance in modern therapeutics in Europe and America has been due to such intimate and continuous co-operation. The large-scale manufacture of pharmaceuticals can be successfully achieved by the joint endeavours of a chemist and a pharmacist, while evolution of new medicaments and success in drug synthesis are possible when a chemist and pharmacologist work hand in hand. It is therefore a welcome sign of the times that in the post graduate courses of some of the Universities of India, higher studies in Pharmaceutical Chemistry are being linked with studies in pure chemistry. Again the Indian Institute of Science at Bangalore has taken a forward step in creating a lectureship in pharmacology to carry on collaborative work with the departments of Organic and Bio-chemistry. We hope that these examples will be followed in all higher centres of chemical research in India and these joint endeavours in allied branches of science will be productive of immense good to the country.

The Pharmaceutical Association of India should be doing a real public service if it could take a leading part in controlling the use of drugs in the country. This is a problem of considerable difficulty and complexity even in countries imbued with the spirit of modern science. In India when right thinking in such matters does not practically exist and where the public are exceedingly credulous and believe in all kinds of mysticism, the task is almost superhuman. Many of the most serious diseases are amenable to proper treatment by drugs whose values have been assessed by proper scientific methods, *e.g.*, malaraia, kala-azar, dysentery, syphilis, etc. The administration of useless remedies in these cases is not a harmless comedy, it is a question of life and death. Victims of quacks are no less to be pitied than victims of Nazism, and we cannot in this country adopt too soon a therapy based on the principles of exact science. It should be one of the duties of this Association to prevent the cruel fraud which is being perpetrated on ignorant and helpless people by supplying them with bogus remedies.

The Indian Drug Enquiry Committee recommended very strongly that steps should be taken immediately to bring into being an Indian Pharmacopœia. The majority of drugs included in the Pharmacopœia of any country are derived from the vegetable kingdom. Sir J. D. Hooker once observed that the flora of British India was more varied than that of any other country of equal area in the globe. Drugs manufacturers from Indian vegetable products have, in considerable number of cases, been found to be equal in therapeutic value to those that are imported from abroad. When a drug has been *scientifically* prepared and tested, no matter whether it be of the Ayurvedic or Yunani system, there is no reason why it should not find a place in the Indian National Pharmacopœia. The Forest Departments are now keenly alive to the cultivation and collection of herbs of medicinal value. Such efforts can be given an impetus and organised on a permanent basis if the preparation of an Indian Pharmacopœia is immediately taken in hand. The Indian Universities may also render considerable help by providing facilities for research in plant chemistry. In fact in many chemical laboratories, the research workers are keen on tackling such problems, but they are handicapped for lack of resources. In the debate on the Drugs Bills, many non-official members demanded the preparation of an Indian Pharmacopœia, but no assurance was forthcoming from the Government that this demand would be considered sympathetically. Pharmaceutical studies of Indian drugs are still in their infancy and such studies can only be effectively completed within a reasonable period by co-operative agency which will bring together the best talents in the country and provided by the State with ample resources and charged with duty of preparing an Indian Pharmacopœia. The expenditure involved in the venture will repay itself by lowering the cost of drugs of indigenous origin and bringing them within the purchasing power of the bulk of our countrymen.

In the new order of things that is inevitably coming members of every technical profession will have to devote more attention to rendering efficient service to the community and less to the improvement of their status and prospects in life. The change from the administration of wild herbs in the crude state to that of synthetic drug or potent biological preparations is perhaps one of the highest achievements of human endeavour. But unfortunately these drugs and biological preparations are manufactured under such an economic system that their benefits are enjoyed by a few. We are told that in Russia, patent laws do not apply. The Soviet Government manufacture all the medicines that are needed for the people of the Republic with the most cynical disregard of the rights of those capitalistic concerns who claim proprietary over the production of such drugs. In fact, that Government takes pleasure in disclosing to all Health Organisations in all parts of the world details regarding the processes for the manufacture of important drugs in Russia. Thus the method that is adopted for the manufacture of 'Atebrin' in Russia has been given in details to an important Public Health Institute in India. The Great Pasteur, who is the father of modern preventive medicine and the therapy based on biological preparations never took any patent to enjoy the fruits of his discoveries. Why should not his examples be followed by the discoverers that come after him? We should not forget for a moment that ours is perhaps the poorest country in the civilized world, and the chief aim of the profession of Pharmacy in India should be to bring the blessings of modern therapy to the door of the poorest. Simultaneous progress in many directions is necessary to achieve this end, but I hope that this Association will never lose sight of this ideal even though its realisation may be distant.

THE PURIFICATION OF WATER IN WAR TIME

Referring to a broadcast talk on methods for the purification of water in war for drinking and cleansing purposes in the event of boiling becoming impossible owing to disturbance of the electricity or gas services, which was given by Lt.-Col. Mackenzie, Director of Water Examination, Metropolitan Water Board, and in which he recommended the use of chlori-

nated soda and photographic "hypo", the *Pharmaceutical Journal* (August 17, 1940: 145: 54) publishes a useful formula:—"Dissolve 3 ounces of crystalline sodium carbonate in 5 fluid ounces of water. Triturate 2 ounces of bleaching powder with 15 fluid ounces of water. Mix the two liquids and allow to stand, with an occasional shake, for three or four hours. Filter and dilute the filtrate to 50 fluid ounces. Keep in a stoppered bottle away from the light. Pack in 4 ounce coloured bottles, fitted with rubber or rubber compound corks, and label." "Add 10 drops to 1 pint of water; stir, and allow to stand for five minutes. Then add a crystal of 'hypo' and stir. When dissolved the water can be drunk." Milton or Chlor-San can be used for the purpose of purification as they both contain chlorine, but other disinfectants should not be employed, unless on qualified recommendation, as they may contain harmful or unpleasant substances. The somewhat unpleasant taste of the chlorine is destroyed by the addition of the photographic "hypo".

—*Practitioner.*

QUERIES AND ANSWERS

IS LEUCODERMA AN ALLERGIC CONDITION?

N. C. DAS GUPTA, M.B. (Cal.), *Khulna*

I give below report of three cases which tend to show that leucoderma might be an allergic condition like eczema and several other skin affections. Further investigation, particularly regarding biochemical changes, is, of course, necessary to definitely establish the relationship, and I hope works interested in this special branch would take up the investigation and carry it to success so that the stigma attached to this otherwise innocent disease may be removed and rational method of treatment found out.

CASE—H. F. 17 YEARS

Complaints—Two patches of leucoderma, one about the size of a half rupee, the other a tiny little spot, placed respectively on the inner side of the right foot and outer side of the left ankle.

Family history—Paternal grandfather, father and two uncles—eczema, one uncle died of pulmonary tuberculosis; two others have high blood pressure; Maternal great-grandfather died of apoplexy; maternal grandfather has migraine. No history of syphilis, leprosy, leucoderma or asthma.

Personal history—Lives on mixed diet, no history of specific disease.

History of the illness—When 3 years old had an attack of asthma. Occasional fits occurred till the 6th year, when she got a patch of leucoderma on the left knee and another on the shoulder. The asthma disappeared for the time being and since never occurred within the next three years, that is, the period for which leucoderma disappeared with the following treatment *viz.*, (1) emetine and soamin injections, (2) mercury and arsenic by mouth, and (3) local application of Pulv Psoralis. Oil Bouchi was tried in the early stage (1930).

A few months after the disappearance of leucoderma she again began to have attacks of asthma.

In 1934, a small patch of leucoderma reappeared on the outer side of the left ankle and the asthma again left her. The old treatment was tried with effect this time too.

Both the complaints seemed to have left her and she remained well for two years when the patch on the left ankle again made its appearance (1936), to be cured again by Psoralis and Collosal Sulphur (Crook's).

In 1938, the present patches developed and have been persisting inspite of the old treatment. Since 1934 she has had no attacks of asthma. But since 1939 she frequently suffers from joint trouble—painful swelling.

Pain and tactile sensations over the affected skin are normal. The colour is milky white.

Her general health and physique are good. W. R. Negative.

CASE II—H. M., 50 YEARS

Family history—A son aged 10 had three attacks of asthma within the last 2 years; no history of leucoderma.

Personal history—Mixed diet, no intoxicant, no specific.

History of the illness—Had asthma in boyhood. It disappeared in adolescence to be followed by leucoderma, which gradually spread all over the hands, feet and lips.

No loss of tactile or pain sensation.

CASE III—H. F., 45 YEARS

Family history—nothing particular.

Personal history—mixed diet, no specific. Has been suffering from frequent attacks of asthma for years. Since about two years there have developed a few patches of leucoderma over the body. Fits of asthma occurring just as before.

DISCUSSION

The occurrence of leucoderma alternately with asthma and final replacement of the latter by the former as well as the development of one over the other clearly suggest a close relationship between the two. Besides the family history of other recognised allergic diseases, such as eczema, migraine and asthma, in which heredity plays an important factor, strongly supports the theory of allergic origin of leucoderma.

BOOK REVIEWS

TEXT-BOOK OF MEDICINE—Edited by J. J. Conybeare. Fifth Edition, 1940. Pages xviii+1131. Illustrated. Demy 8 vo. Published by E. & S. Livingstone, Edinburgh. Price 24 *s.* net.

The Text-book of Medicine owes its popularity to its concise and lucid manner of presenting the diseases and dealing with all the important aspects of them, including etiology, pathology, symptoms, prognosis, diagnosis, differential diagnosis and treatment. That the book underwent five editions since 1929 is itself a testimony to its wide popularity. The various subjects have been written by eminent physicians who have specialised in each. The book begins with infectious diseases. The chemotherapeutic properties of sulphonamide have been appropriately dealt with including the usual precautions which are to be taken during exhibition of the same. Various details of practical utility have been included, for instance, Vi-serum treatment of typhoid fever, the method of desensitisation in serum treatment, the value of sedimentation rate as guide to progress of diseases, the advent of highly refined globulin-modified (protein digested) sera, the use of non-specific preparations like placental extract for prophylaxis against measles and such others. The carrier problem also has not escaped the attention of the authors.

The section on tropical diseases has been written very concisely, yet retaining all the important and practical points of diagnosis and treatment. Then follow chapters on the diseases of infants. diseases due to physical agents, poisonings and intoxications, diseases of the ductless glands, of metabolism and of the liver, spleen and lymphatic glands, in which nothing of practical importance has been left out. In the section dealing with diseases of the alimentary canal, the methods of physical examination have been very lucidly written and a very full description is given of gastroscopy. The difficult subjects of diverticulitis and of anorexia nervosa have been rewritten. In the chapter on respiratory diseases, the authors rightly deprecate the repeated injections of cardiac tonics like strychnine or camphor, in pneumonia, but their advocacy of alcohol cannot be always supported, when peripheral failure dominates the scene, as is very frequently the case. The chapter on renal diseases occupies only 68 pages but a wealth of useful information is contained within them. The authors deal briefly with extra-renal azotæmia and rightly stress that an increase of blood urea is not necessarily associated with disturbance of renal function, but that the combination of various factors, such as urine of low specific gravity, low urea concentration, normal chloride content associated with normal or high blood chloride and a normal or low alkali reserve (alkalosis) are the chief features of azotæmia of renal origin.

In the chapter dealing with diseases of the nervous system, the various diseases have been systematically indexed and described in a condensed manner, but incorporating all the essential details regarding anatomy, pathology, morbid anatomy, besides etiological and other factors already mentioned. The diseases of the cardiovascular system have been partially rewritten by Dr. Maurice Campbell who in conjunction with the editor, has wholly rewritten the section of essential hypertension. The authors consider that its etiological factor is possibly of renal origin. In dealing with hypertensive encephalopathy the authors described two types, one with cerebral œdema and the other without it. In both types, cerebral angiospasm is thought to occur, explaining the transient character of focal signs, such as hemiplegia, aphasia and such others. The authors however express doubt on the theory of vasospasm and recently Rosenberg, after clinico-pathological study of the brain of 12 cases of malignant hypertension, suggests that the transient cerebral phenomena, ascribed to vasospasm, may often be associated with widespread destructive lesions. Regarding electrocardiographs, we are unable to agree to the view that the value of the special chest leads is concerned only in the diagnosis of coronary thrombosis, as the routine use of special chest leads gives us various other important and vital informations as described by Paul Wood. Again, the dictum that in heart rates of over 120 per minute, extra-systoles are rare, may be misleading when toxic myocarditis with heartfailure dominates the scene. The irregular heart beats with a rate of over 120 per minute may not always be due to auricular fibrillation.

We are glad to find that pyrotherapy has been admitted as efficacious in the treatment of rheumatoid arthritis, but we are sorry to miss physiotherapy in the treatment of various other diseases. This is an omission, which may be rectified in future edition.

A very valuable chapter on psychological medicine has been included together with various syndromes associated with it. The concluding chapter deals with common diseases of the skin.

On the whole, the book contains a wealth of information, very valuable for both medical students and practitioners.

P. G.

DISEASES OF THE NERVOUS SYSTEM FOR STUDENTS AND PRACTITIONERS—By F. M. R. Walshe. First Edition, 1940. Pages 288+xiii. Royal 8 vo. Published by E. & S. Livingstone, Edinburgh. Price 12 *s.* 6 *d.* Postage 7 *d.*

To a beginner, the path of the study of Neurology is beset with the thorns of the complicated nature of the anatomy of the nervous system and the vastness of the subject itself. These difficulties have been efficiently removed by the expert hands of the experienced author by the inclusion of the basic anatomical principles which are absolutely essential for the proper conception of the subject; and the omission of the rare diseases, rare varieties, or rare symptoms and also of the discussion of the various debatable etiological factors.

In every branch of art or science, the taste has got to be created by the appreciation of its sweetnesses, laid bare from its concrete coverings—the complications; and I am sure this book

will act as a great canvasser to attract apprentices to this interesting branch of medicine, which acts like so many algebrical formulæ.

Though localisation is supposed to be the first thing in the diagnosis of neurological disorders, the author has explained in a very simple manner, that of the four groups of symptoms (*a*) those due to shock, (*b*) those due to destruction, (*c*) those due to irritation and (*d*) release symptoms, only those due to destruction and irritation admit of localisation and that again when the lesion is of chronic onset, as in acute cases, the nervous system acts as a unitary integrity.

The chapter on Psychoneuroses will avoid the common pitfalls of taking these cases to be of neurological origin—the symptomatology, diagnosis and treatment have been dealt in such a lucid manner that it can be easily understood and followed by the general practitioners without any knowledge of psychology.

The publishers are to be congratulated on the fine printing and get up of the book at such a low cost.

C. SAHA.

NEUROSYPHILIS—By C. Worster-Drought, 1940. Pages xiv+241. Illustrated. Demy 8 vo. Published by John Bale, Sons & Staples, Limited, London.

In a space of 241 pages the author has endeavoured to give an account of syphilis of the nervous system. In this the author is to be greatly congratulated on this monograph.

In this volume though the subject has been approached mainly from the clinical standpoint the whole aspect of neurosyphilis has been covered by the inclusion of description and illustrations of the morbid anatomy and histopathology of the diffrent forms in which the disease affects the nervous system.

The historical account of syphilis and neurosyphilis is good. In the section on etiology the author has discussed the dualistic hypothesis of dermatropic and neurotropic strains of spirochœte and has given his views against this theory in a lucid, interesting and persuasive manner. All factors which tend to reduce the resistance of the nervous system, racial or familial syphilization and the lack of adequate treatment have been put forward by the author as the important etiological factors in neurosyphilis.

In chapter VII the author has given an excellent account of the findings of the cerebrospinal fluid and serological reactions in different aspects of neurosyphilis.

In the treatment of neurosyphilis intrathecal administration of salvarsanized serum and intrathecal injection of neosalvarsan solution have been described in detail though these methods are not frequently employed these days; but just a mention of electropyrexia has been made without any description of the technique employed though this method is now-a-days being employed in many venereal diseases clinic with satisfactory results.

These are only some of the minor criticisms and in no way alter our views that this is an excellent work on neurosyphilis and presents the subject in a way which will be of great help not only to syphilologists but also to neurologists and general practitioner.

J. M. M.

CHEMISTRY (Catechism Series) Part I and II—First Edition, 1940. Pages 152. Crown 8 vo. Published by E. S. Livingstone, London.

These two notes on chemistry, both inorganic and organic are concisely and clearly written and should be of help to students preparing for the first M.B. examination.

H. N. MUKHERJI.

BIRTH CONTROL SIMPLIFIED—By Dr. A. P. Pillay. First Edition, 1940. Pages ix+138. Illustrated. Demy 8 vo. Published by D. B. Taraporevala Sons & Co., Bombay. Price Re. 1-14 net.

Dr. Pillay has written this book for the lay public, in order to help married couples to solve their own contraceptive problems and select the method or methods best suited to them. He has succeeded only in dishing up a somewhat indigestable *hotchpotch*. Starting from the safe period and condoms, he has gone through chemical contraceptive, household contraceptive, pessaries and caps and has ended in salpingectomy and vasectomy. The number of methods described, their various possible and impossible combinations and the list of indications and contraindications for their use must surely be confusing and largely unintelligible to laymen. It is well worth to remember that though the population of our country will be about 400 millions in this census, the maternal and infant mortality are both very high. Over and above that millions of people die every year from various tropical and other diseases. It has been estimated that the average income per head of the population is approximately 2 annas a day and in the words of a Director of Public Health of Bengal "The peasantry are in a very large proportion taking to a diet on which even rats could not live for more than 5 weeks." The effect of such conditions on the health of the people may be judged from the fact that the average expectation of life in India is about 25 years. In such a state of affairs, contraceptives will not raise the expectancy of life, standard of living etc., unless public health measures are intensified to eradicate the ravages of diseases and industrialisation, scientific agriculture, irrigation and electrification are resorted to.

The expense of known contraceptives is such that they can not be recommended to or afforded by agriculturalists or labourers. From Dr. Pillay's table of comparative cost of contraceptives we find that cost per coitus, using a safer method, is 4 annas. As such it is double the average daily income per head of the Indian population. Contraceptives used by a handful of rich men will not solve the difficult problem with which we are faced to-day. Indiscriminate use by the middle class is definitely detrimental to the future of our country, because they are virtually the backbone of India to-day. It is not possible to discuss the various questions which arise in this connection here.

Dr. Pillay is to be congratulated for the pains he has taken to compile the book. The diagrams, unfortunately, are poor and in places inaccurate. The lurid picture on the cover illustrating female anatomy with a contraceptive on, does not speak highly of a scientific book written by a doctor.

B. P. NEOGY.